VOLUME XXVII NUMBER FIVE

THE NATIONAL GEOGRAPHIC MAGAZINE

MAY, 1915

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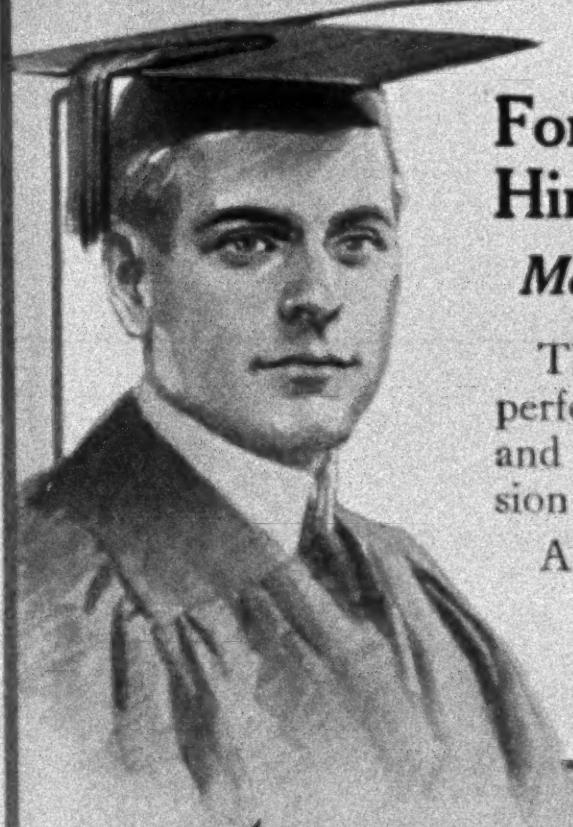

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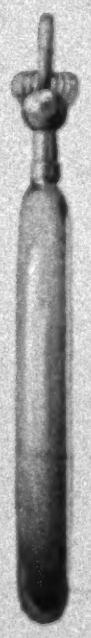
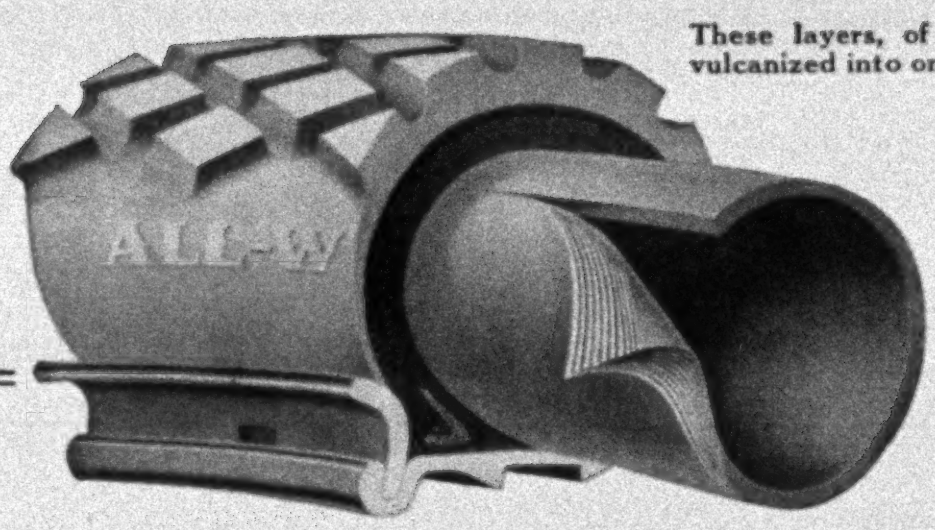


The Thin Model of Railroad Accuracy

HAMILTON WATCH COMPANY

Dept. 35 **Lancaster, Pennsylvania**



These layers, of course, are vulcanized into one solid tube.

Goodyear Laminated Tubes
Outlast Any Tire

We have built an Inner Tube—laminated and extra-thick—which outlasts any tire. Four Tubes outwear five Casings, on the average.

This year we have made them **still thicker.** To our smaller sizes we have added 12½ per cent. To our larger sizes, 16⅔ per cent of unadulterated rubber.

Yet, despite this increased weight—averaging 14 per cent—our prices are **one-fifth less.** On February 1st we reduced them 20 per cent. So these heavy, Laminated Tubes now cost about the same as others.

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Tubes built by machines, of one thick piece of rubber, often have undiscovered flaws. We roll the rubber into sheets so thin that flaws can be seen and discarded. Then these sheets, wrapped layer on layer, are vulcanized into a solid rubber tube.

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Any dealer will supply Goodyear Tubes or Tires.

GOODYEAR
AKRON, OHIO

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Extra Heavy Tubes—Uncolored
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By the Makers of Fortified Tires

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Goodyear Tubes are gray, the natural rubber color. Any other color requires mineral adulteration. Minerals absorb heat, the greatest foe of rubber. We cannot color without making short-lived tubes.

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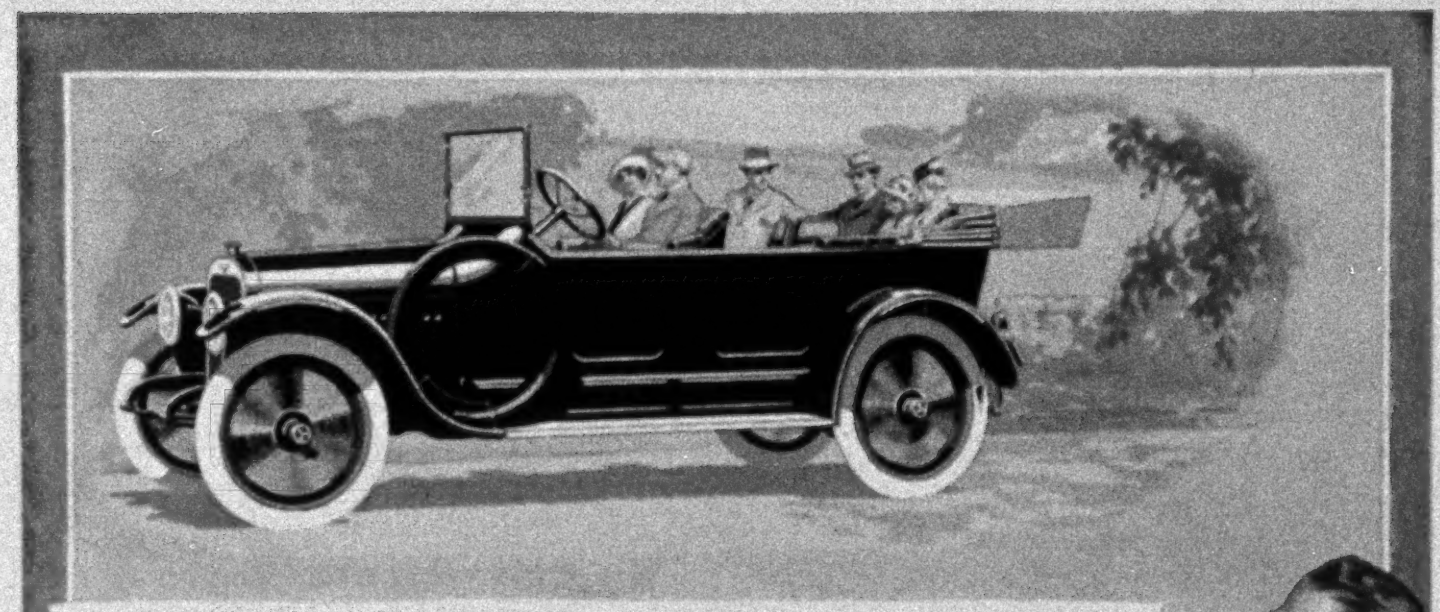
(2317)



Think How It Will Seem in the Future

In the Light Six you buy, the important thing is to know how it will seem next year.

All models look well, all demonstrate well. No car could be sold if it didn't. But many a fair-seeming car proves a sad disappointment. And mistakes in this line are costly.

You note that experienced motorists don't buy untried cars. They have had their fill of experiments.

New Risks This Year

This is a year of Light Sixes—a new-type car involving radical changes. Those changes bring many uncertainties unknown in the time-tried types.

Formerly the average Six weighed 4500 pounds. The Light Six, if true to its type, weighs under 3000 pounds. The weight of ten people has been taken out. Tire and fuel cost has been cut in two.

This means new materials, new principles. It requires a new type, high-speed motor. A thousand parts have been re-designed. All that was known and tried and standard is revised in creating a true Light Six.

One can hardly say, "I will stick to the old type." The new type has come to stay. But a man this year should be pretty certain about the new-type car he buys.

Looking Backward

That is why experienced motorists are buying HUDSONS by the thousands. There are 12,000 owners of HUDSON Light Sixes who look back on an excellent record. In two seasons these owners have driven, perhaps, some 30 million miles. And they have proved beyond question that the HUDSON is faultless. There are men all around you who can tell you now how the HUDSON will seem in the future. Those millions of miles of hard driving have wiped out every question, every risk.

Pride is Important

It is more than pride which leads men to buy HUDSONS. But pride is important, too. Any man likes to feel that his car is a class car. It doubles the enjoyment of motoring.

But class has come to this HUDSON model through four years of ceaseless refinement. We have had time to perfect every part and detail. We have had the designer—Howard E. Coffin—best qualified to do it. It is more than pride that sells HUDSONS. It is the appeal of a finished production.

We have a trebled output this spring over last spring. But the long waits of last summer are sure to be repeated. That is always so at this season with first-choice cars. A man is wise to decide on his new car before the winter surplus is sold.

The HUDSON, in this class, will be your first choice. Prove that in time to get one without a long delay.

7-Passenger Phaeton, $1550, f. o. b. Detroit. Four other body styles.

The HUDSON Company never loses interest in the car it sells. So long as a car is in service we maintain our interest in the character of its service. That's one great reason for HUDSON reputation.

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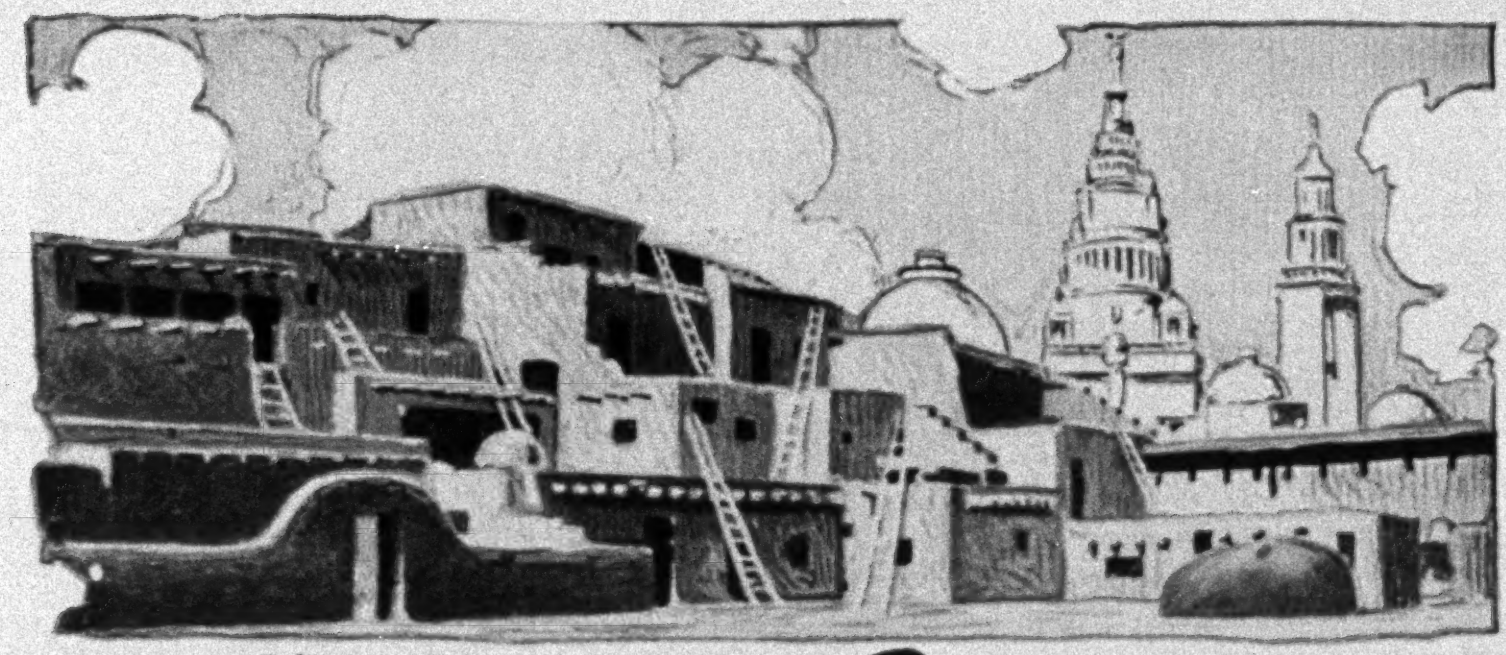
HUDSON $1550



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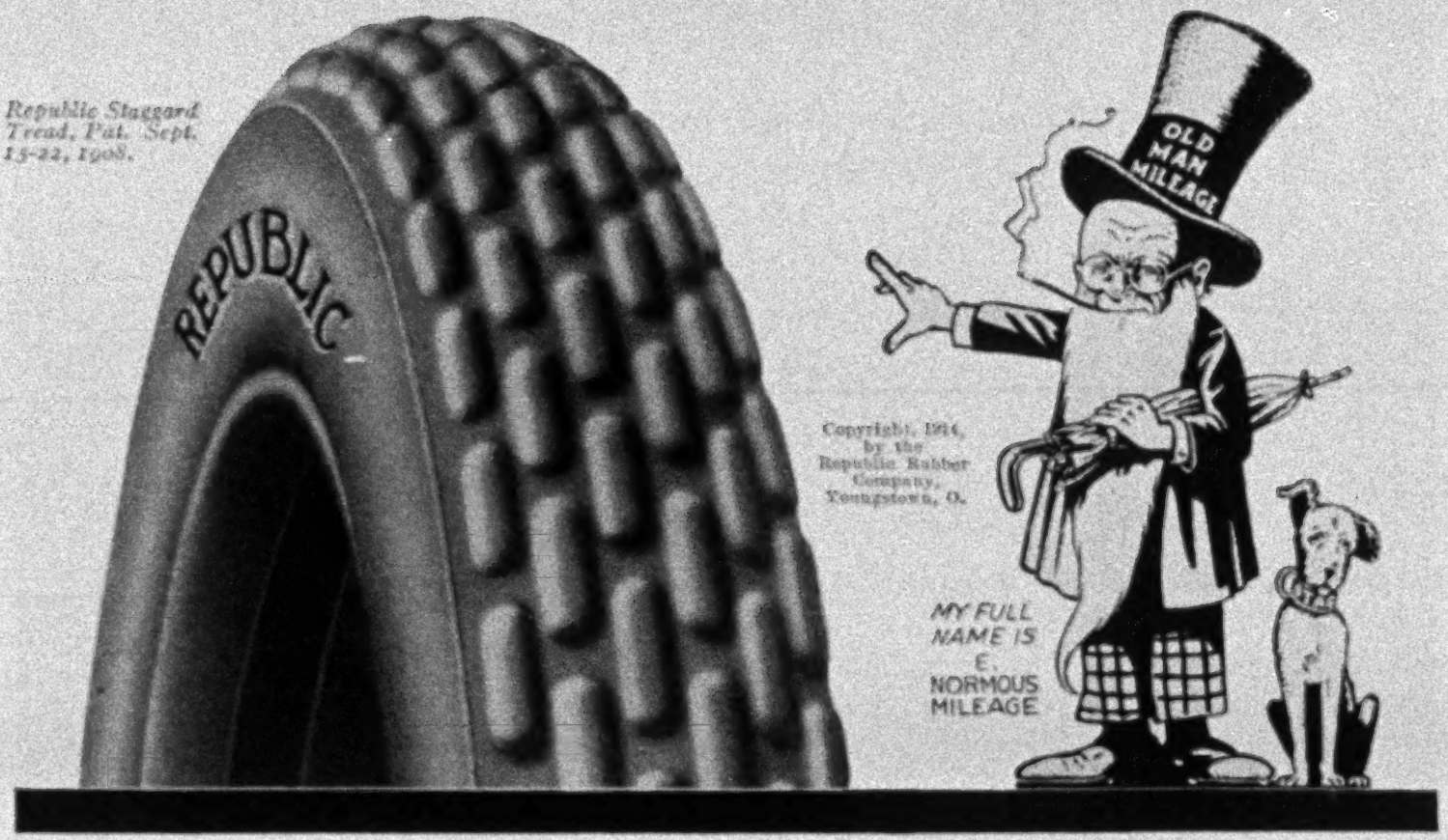

"These long, tough studs are scientifically correct"

—says Old Man Mileage

"The principles governing the construction of the Republic Staggard Tread are based on study of road surfaces, on analysis of skidding dangers, on *real* knowledge of conditions that beset tires.

"First of all, the studs are designed to meet the road in a longitudinal position, which insures a firm grip and prevents skidding and side-slipping.

"Second, they are 'staggard,' each row overlapping the other on the road, thus giving perfect traction and a smooth, even running surface.

"Third, they are rounded at the ends, and therefore will not catch nails and other sharp objects.

"Fourth, they have a filleted base and are set far enough apart to prevent trapping of sand and grit.

"Fifth, they are set in six rows thus distributing the strain over the largest possible area.

"Add to these five points of superior tread construction the highest quality of material and workmanship obtainable, and you have in Republic Staggard Tread Tires the world's greatest non-skid mileage maker, the original, effective non-skid tire, that cost more to buy than many, but less to use than any."

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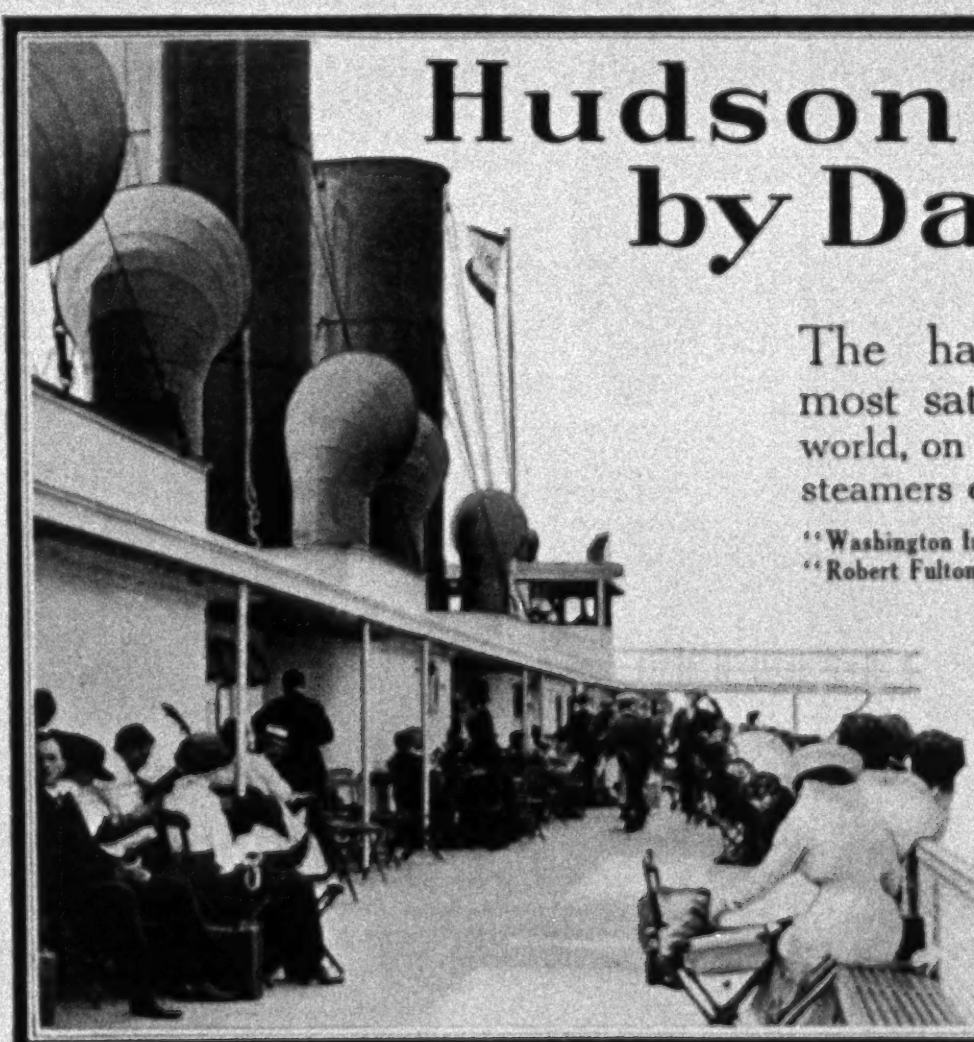

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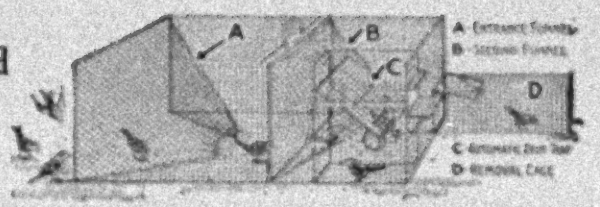
J. ROGERS WARNER, *Exact Size*

963 Lockwood Bldg. BUFFALO, N. Y.

The Improved Dodson Sparrow Trap



Help us get rid of sparrows and native song birds will return to our gardens. U. S. Dept. of Agriculture Bulletin advocates destruction of English Sparrows.

Thousands of sparrows now being caught by this new improved Dodson Sparrow Trap. It works automatically, all the time. Has a double funnel trap on left, an automatic drop trap on right; catches sparrows at both ends. *No other trap like this.* Dodson trap is made of strong electrically welded wire; lasts a lifetime. Price, $6.00, f. o. b. Chicago.

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Beautiful illustrated booklet tells how to win native birds; it is free; write for it. Mr. Dodson, a Director of the Illinois Audubon Society, has been building Bird Houses for 20 years. Dodson Houses are proven successes in thousands of gardens. If you love birds, get a sparrow trap and also one or several Dodson Bird Houses. Write for the free booklet today.

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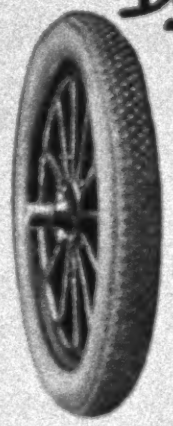

For over three years European motorists have been getting from 10,000 to 15,000 miles out of their tires by "half-soling" them with Steel Studded Treads.

In eight months 20,000 American motorists have followed their example and are **saving $50. to $200. a year** in tire expense.

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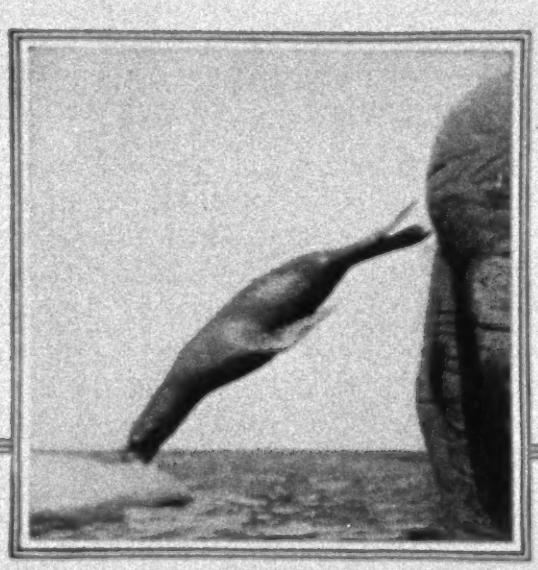

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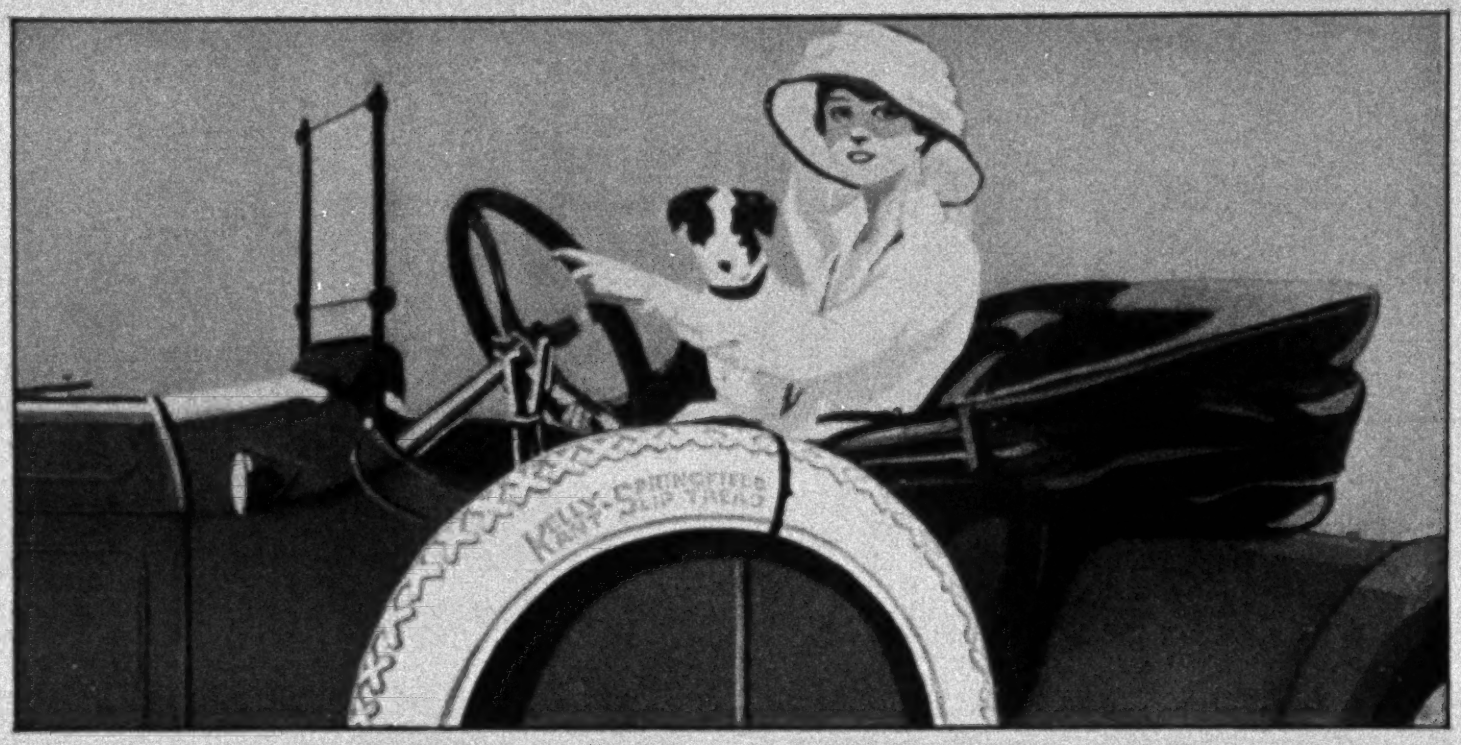

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VOL. XXVII, No. 5 WASHINGTON MAY, 1915

THE NATIONAL GEOGRAPHIC MAGAZINE

THE GATES TO THE BLACK SEA

The Dardanelles, the Bosphorus, and the Sea of Marmora

BY HARRY GRISWOLD DWIGHT

TO THOSE who have a passion for maps the maneuvers of the Allied fleets in the Near East would scarce be needed to draw attention to those inmost recesses of the Mediterranean—the Black Sea and the Sea of Marmora. There is something alluring in the very shape and position of these lakes, separating as they so nearly do the two most historic continents of our globe, and communicating with each other and with the outer seas by openings that seem almost miraculous.

And those landlocked waters, at once a barrier and a highway between East and West, have been from the earliest times, as they happen again to be today, the theater of epic events. It may be that Chinese and Indian legends of the Eastern seas point back to a more ancient period in the story of the world; but for us of the West no legends are older than those of Zeus and Io, of Phryxus and Helle, of the Trojan war, of Jason and the Argo, which commemorate the earliest voyages into the Great Lakes of the Levant.

Of the two, the Marmora—the Propontis, if you prefer to be classical—is by far the smaller. Not much more than 100 miles long and some 40 miles across at its broadest point, it is about the same size as Lake Champlain. The Marmora is a sort of vestibule between the outer and inner doors of the Black Sea—the Dardanelles and the Bosphorus.

The Bosphorus is the shorter and narrower of the two straits. It is about 20 miles long, and at one point of its tortuous course the hills of Europe and Asia come within 550 yards of each other (see pictures, pages 438 and 439).

The Dardanelles, or Hellespont, is a little more than twice as long and nearly twice as wide as the Bosphorus, varying from 1,400 yards to 5 miles. Its right, or European, shore is formed by the peninsula of Gallipoli, the Thracian Chersonese of the ancients, whose steep ridge overlooks the plain of Troy on the Asiatic bank and the broken foot-hills of Mount Ida.

The Marmora and the Black seas are no more than 20 miles apart at their nearest point; but it is astonishing what a difference in aspect 20 miles may make. The Marmora has much of the softness of air, vividness of color, and beauty of scenery that we associate with the Ægean and Ionian seas. Thread the narrow slit of the Bosphorus, however, and you pass into an entirely different world—sterner, barer, rockier, colder. It is partly perhaps that the Black Sea is very much larger.

If the Marmora may be compared to Lake Champlain, the Black Sea is about four times the size of our greatest lake, Lake Superior is 412 miles long by 167 wide, while the Black Sea has a length of 750 miles and a breadth of 385. That there is something dark and unfriendly

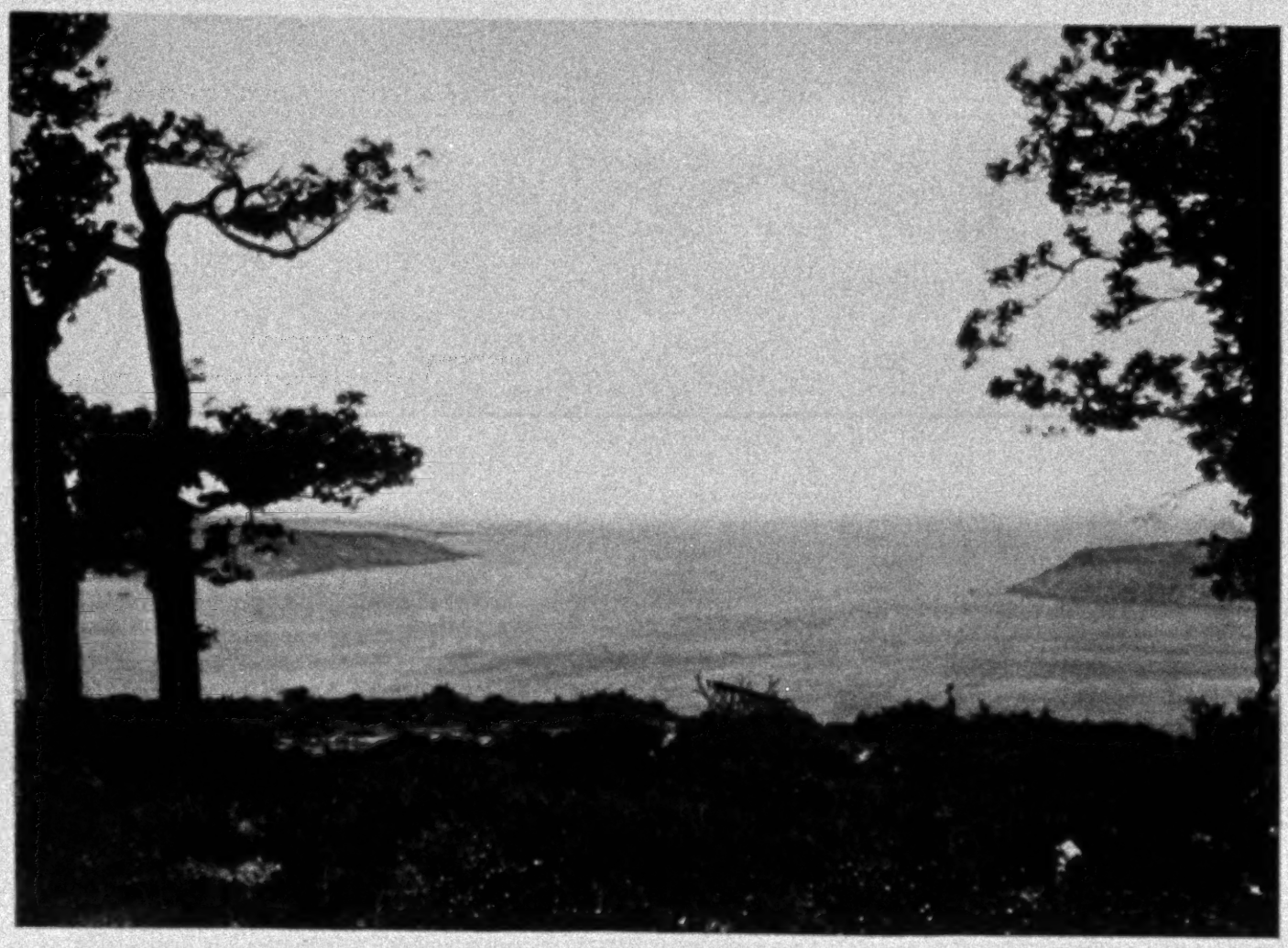


Photo by H. G. Dwight

THE NORTHERN MOUTH OF THE BOSPHORUS, LOOKING INTO THE BLACK SEA

The shores are strongly fortified with modern masked batteries. The Russian fleet before reaching Constantinople (page 441) must enter the narrow mouth shown in the above picture and proceed through the straits approximately 17 miles, through such scenes as are shown on pages 438 and 439.

about it is more than a legend. It has, of course, its suaver moments and its happier strips of coast, as in the Crimea and under the shelter of the Caucasus; but much of its European shore is bordered by steppes rolling unbroken to the north.

THE SEA OF MARMORA

While its two historic gateways—the Dardanelles and the Bosphorus—are strategically the most important features of the Marmora, that picturesque little sea has a character of its own, and one not to be caught from the deck of a Mediterranean liner or from the windows of the Orient express. Such impressions as the passing tourist takes away are chiefly of the flat and treeless Thracian shore. The longer Asiatic coast, however, is much more indented, and rises on the southeast to the white peak of the Bithynian Olympus. A high, green headland divides the eastern end of the Marmora into the two romantic gulfs of Nicomedia and Moudania. The south shore again is broken by the mountainous peninsula of Cyzicus.

Off its windy, western corner lies a group of islands, of which the largest is the one that gives the Marmora its name—a mass of marble 10 miles long, famous from antiquity for its quarries. Another considerable island is the long, white sandspit of Kalolimnos, just outside the Gulf of Moudania; but best known are the Princess Isles, a little archipelago of rock and pine that is a favorite summer resort of Constantinople.

In any other part of the world this inland sea would long ago have become a place of sojourn for yachtsmen and summerers, so happily is it treated by sun and wind, so amply provided with bays, capes, islands, mountains, forests, and all other accidents of nature that make glad the heart of the amateur explorer. As

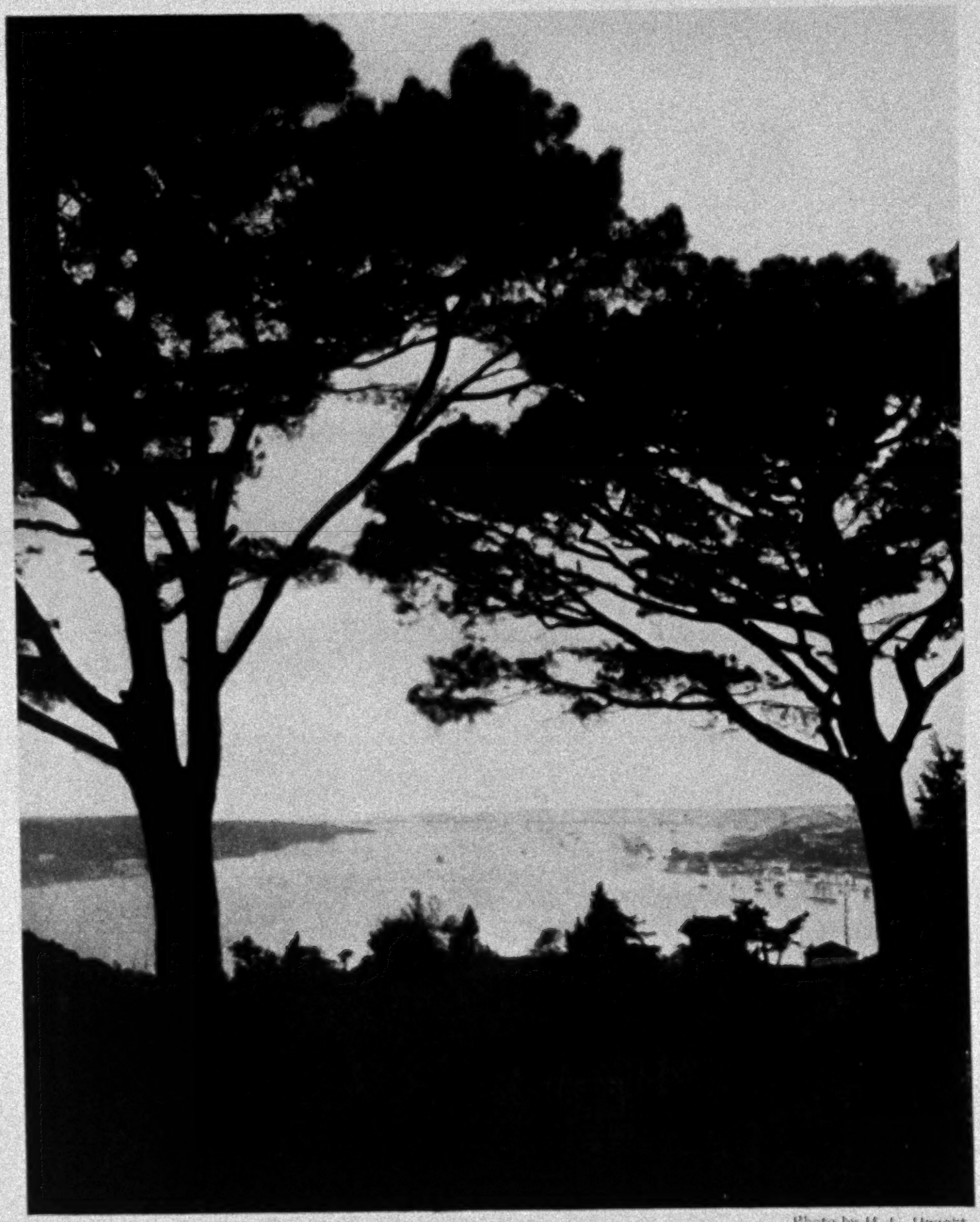


Photo by H. G. Dwight

THE SOUTHERN END OF THE BOSPHORUS, SHOWING THE ENTRANCE TO THE SEA OF MARMORA ON THE LEFT, JUST BELOW THE + (SEE ALSO PAGE 445)

"The Marmora and the Black seas are no more than 20 miles apart at their nearest point, but it is astonishing what a difference in aspect 20 miles may make. The Marmora has much of the softness of air, vividness of color, and beauty of scenery that we associate with the Ægean and Ionian seas. Thread the narrow slit of the Bosphorus, however, and you pass into an entirely different world—sterner, barer, rockier, colder" (see text, page 435).

Photo from Edwin A. Grosvenor

LOOKING UP THE BOSPHORUS STRAIT FROM THE BIG TOWER AT RUMELI HISSAR

The left shores are Europe and the right Asia. "So sharply do its submarine banks descend that large vessels, hugging the land too closely, though in deep water, often run their bowsprits and yards into houses on the shore. Many a shipmaster has paid damages for such unceremonious intrusion, not only of his rigging, but of his sailors, into drawing-rooms and chambers along the Bosphorus. I remember, when making a good-by call upon an English lady at Candili, her matter-of-fact apology for the torn casements of the windows and the disordered appearance of the room. She said that a Greek vessel ran into the house that morning, and that the carpenters had not come to make repairs."—EDWIN A. GROSVENOR.

"CUT-THROAT CASTLE," BUILT BY MOHAMMED II IN 1452, ON THE EUROPEAN SHORE OF THE BOSPHORUS, AS A BASE FOR HIS OPERATIONS AGAINST CONSTANTINOPLE

"And those landlocked waters, at once a barrier and a highway between East and West, have been from the earliest times, as they happen again to be today, the theater of epic events" (see page 435).

Photos by H. G. Dwight

A VIEW OF THE BOSPHORUS AT THE NARROWEST PART

On the farther shore, in the center, may be discerned the castle built by Bajezid I (page 448). The Bosphorus at this point is about 550 yards wide. The current through the straits here is always very swift; in fact, so strong that it is impossible to row against it.

"The Bosphorus never feels the influence of tides. From the vast bosom of the Mediterranean the evaporation is enormous. The contribution of its rivers, moreover, is small in comparison with that of the mighty streams which deluge the Black Sea. So in the Bosphorus the flow southward is constant. The current sometimes attains a velocity of four and even five miles an hour. So violently does it rush by the promontories of Arnaoutkeui and Rumeli Hissar that the strongest boatmen are unable to row against it. This has given rise to a peculiar guild, or craft—the yedekdjis—whose whole business consists in towing vessels up the stream."—EDWIN A. GROSVENOR.

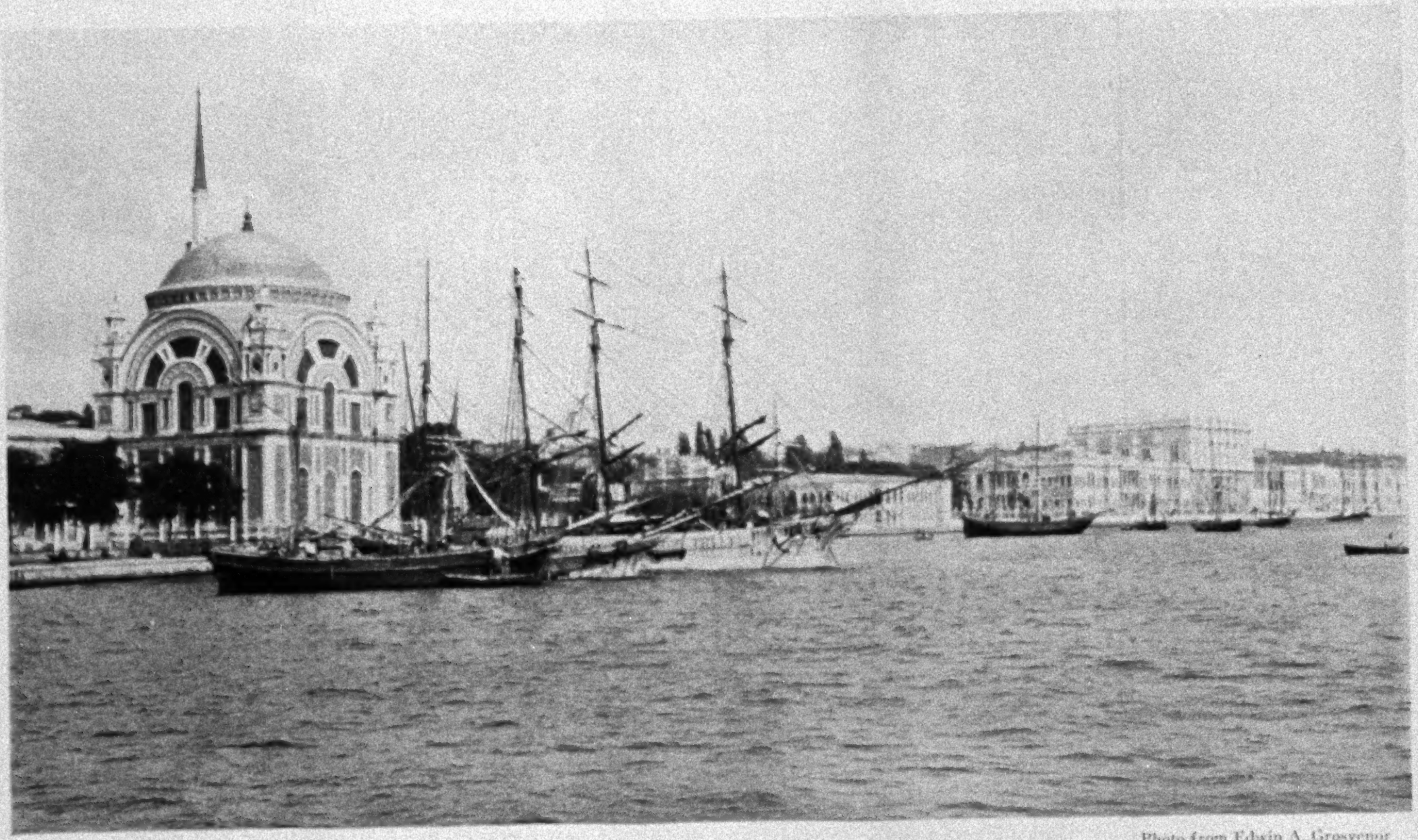


Photo from Edwin A. Grosvenor

THE SHORES OF THE BOSPHORUS STRAIT NEAR CONSTANTINOPLE ARE LINED WITH BEAUTIFUL WHITE PALACES AND PRIVATE DWELLINGS

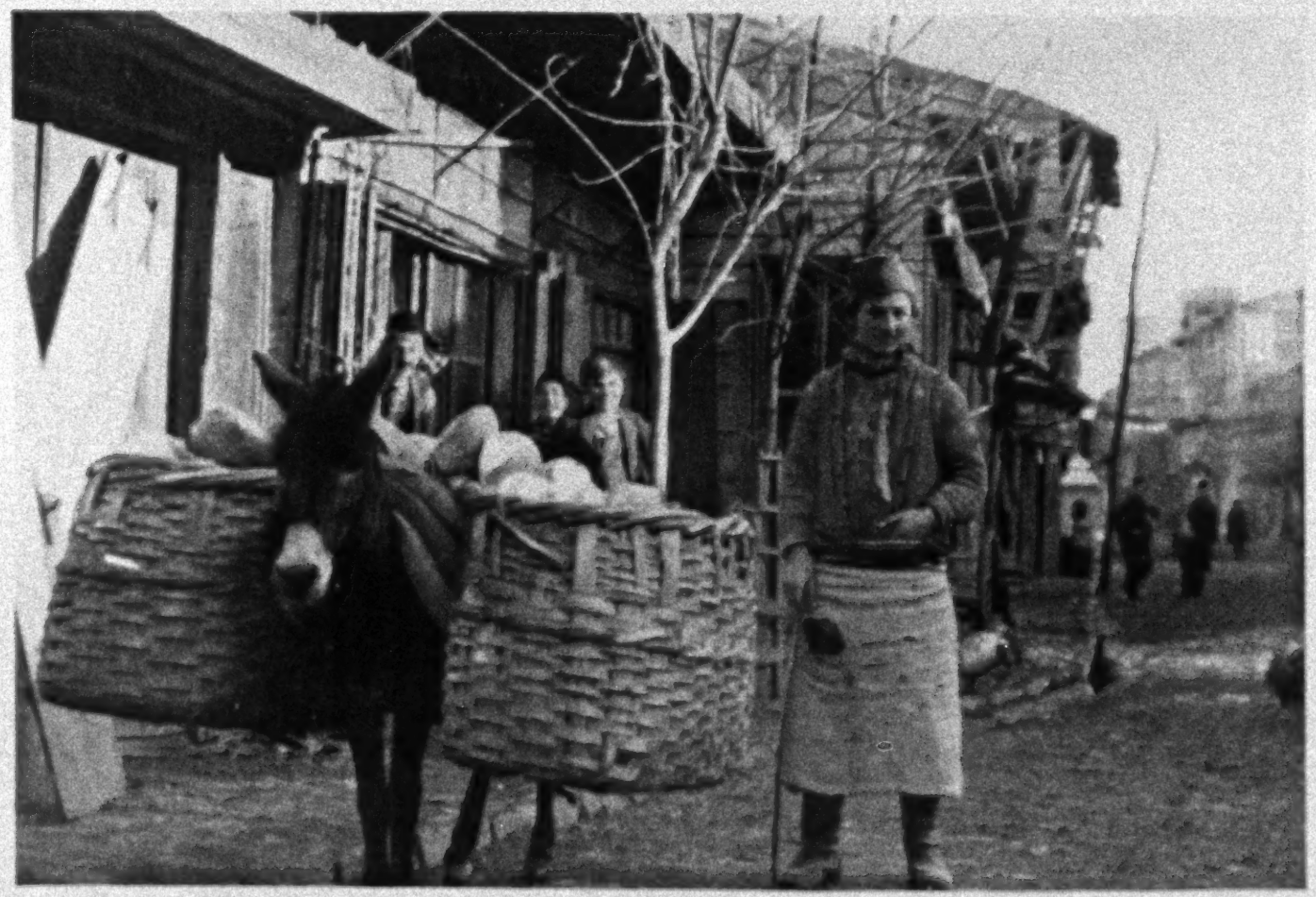
Photo from Edwin A. Grosvenor

THE CITY OF CONSTANTINOPLE: LOOKING UP THE BOSPHORUS AT ITS WIDEST POINT

"Few cities have equaled Constantinople in importance. None in ancient or modern times have exceeded it in dramatic interest. During centuries of the Middle Ages it was the foremost city of the world, surpassing every other in populousness, strength, and beauty, and in the high development of its civilization. To the Mussulman it ranks next to Mecca, Medina, and Jerusalem. The Christian must regard it with still greater reverence. It was the first city distinctively Christian, erected by the first Christian emperor on the ruins of vanquished paganism."—EDWIN A. GROSVENOR.

SCENE IN THE HARBOR: CONSTANTINOPLE

"The focus of this quaint navigation is, of course, Constantinople, standing high and pinnacled on either side of the crooked blue crack that opens into the Black Sea" (see page 443).



Photos by Mortimer J. Fox

SELLING BREAD IN CONSTANTINOPLE

it is, the Marmora remains strangely wild for a sea that has known so much of life; yet its shores are by no means uninhabited and between them plies many an unhurried sail.

The focus of this quaint navigation is, of course, Constantinople, standing high and pinnacled on either side of the crooked blue crack that opens into the Black Sea. (For a description of Constantinople see pages 448 and 459).

In the meantime the busiest town in the Marmora after Constantinople is Panderma, on the south shore, joined to Smyrna by a railway that taps one of the most fertile districts of Asia Minor. In its vicinity exists one of the few borax mines in the world. Another little railway climbs through the olive-yards of the Gulf of Moudania to Brusa, on the lower slopes of Mt. Olympus. This delightful town, the first capital of the Turks and their most picturesque city, is the Hamburg of the Levant, enjoying a renown of many centuries for its hot mineral springs. It is also the center of an ancient silk industry, first introduced from China in the sixth century by the Emperor Justinian. Its cocoons are considered to rank in quality above those of northern Italy and are much exported to this country and to France.

Another ancient watering place of the Marmora is Yalova, in the wooded hills above the Gulf of Nicomedia, whose baths were visited of old by the Emperor Constantine, and there are many less frequented hot springs in this region. It is not for an amateur geographer to say whether this fact is connected with the one that the basin of the Marmora is a center of seismic disturbance. Constantinople has often been damaged by earthquakes, of which the last serious one took place in 1894. In 1912 the strip of coast between Gallipoli and the thriving town of Rodosto was shaken very severely.

This little Riviera is famous for its grapes and wine; so is the charming bay of Artaki, under the western point of Cyzicus, and the neighboring island of Pasha Liman. But the southward-looking slopes of the Gulf of Nicomedia produce a white grape, locally called the *chaoush*, of a flavor to spoil those who taste it for all other grapes in the world.

The Marmora is reputed for its melons, too. Gay cargoes of them, heaped high in picturesque sailing boats, make in the summer the most characteristic touch of local color, and many an olive plantation means a livelihood for many a cluster of red roofs beside a blue bay.

ABOUT NO BODY OF WATER OF EQUAL SIZE HAVE STOOD SO MANY STATELY CITIES

More numerous than the settlements of today, however, are the ruins of yesterday. Every harbor, every headland, has some fragment of ancient masonry, and the workmen in the vineyards are constantly turning up coins, pieces of broken pottery, bits of sculptured marble, that have come down from who knows when or where. *About no body of water in the world, of equal size, have stood so many stately cities.*

It is almost impossible indeed to give any coherent account of the story of the Marmora, so much history and legend have crowded its shores. I have already spoken of the Argonauts, a good part of whose adventures took place in these waters, and of Troy, buried in the marshy plain at the mouth of the Dardanelles. The latter name is derived from that of Dardanus, son of Zeus and Electra and mythical ancestor of the Trojan kings and, through Æneas, of the Romans. The town of Dardanus stood farther in the strait. Colonies from the Greek cities and islands emigrated along these shores in the dawn of European history, carrying with them the spirit of their race and not ceasing to play a part in its politics. Thus Byzantium entered the second Athenian League; and the battle of Ægospotami, which closed the Peloponnesian wars, was fought in the Dardanelles.

The true question of the straits arose as early as the fifth century B. C., when Alcibiades of Athens counseled the people of Chrysopolis, the modern Scutari, at the southeastern extremity of the Bosphorus, to take toll of passing ships. Yet another aspect of the question of the straits had already risen earlier in the century, when the Persian expeditions against Scythia and Greece crossed the Bosphorus and the Dardanelles. What success they had we know, and how a

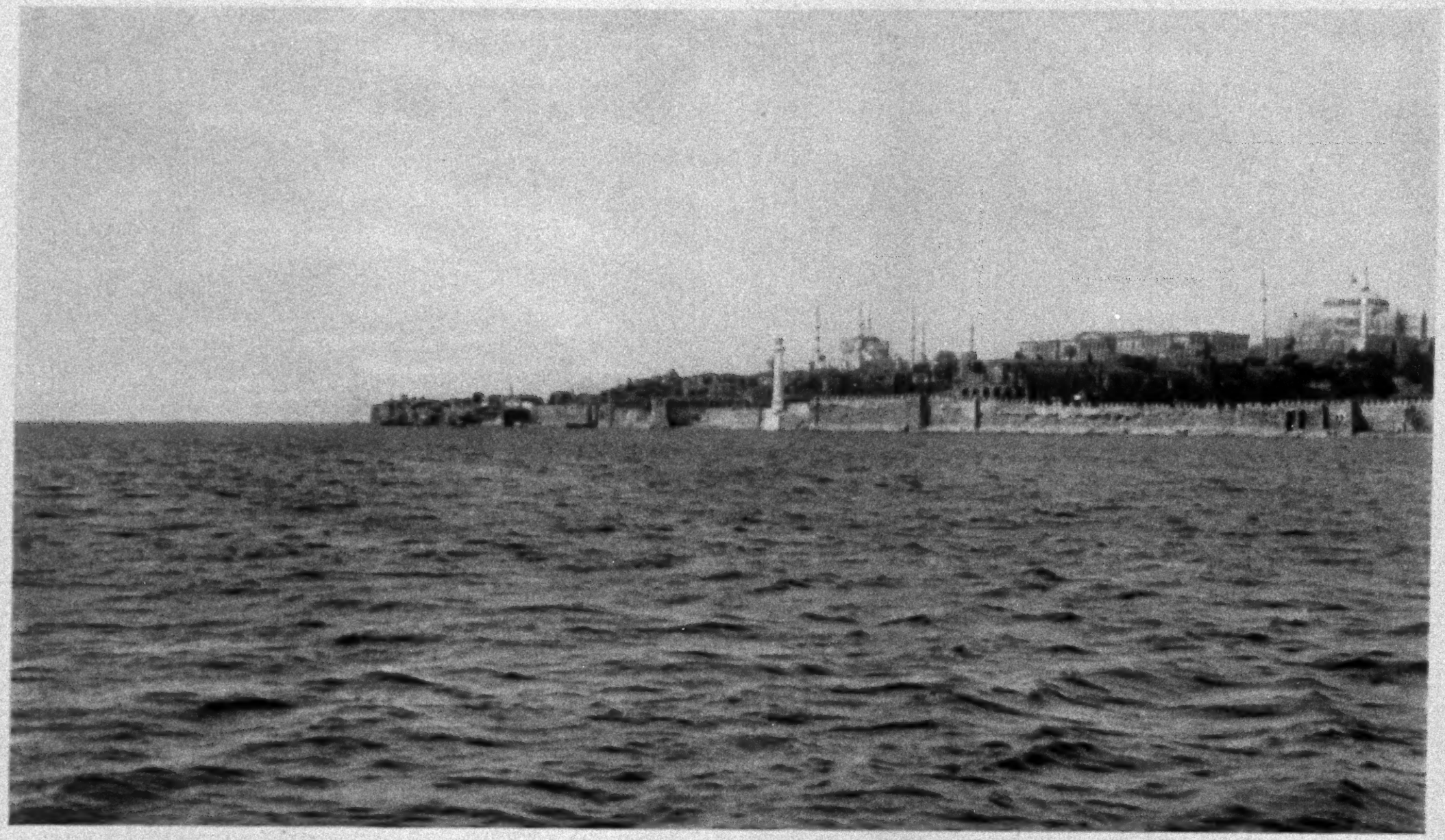


Photo from Edwin A. Grosvenor

ONE OF THE FIRST VIEWS OF CONSTANTINOPLE AS WE SAIL UP THE SEA OF MARMORA AFTER PASSING THROUGH THE DARDANELLES STRAIT

"About no body of water in the world, of equal size, have stood so many stately cities as on the Sea of Marmora" (see text, page 443)

Photo from Edwin A. Grosvenor

THE NARROW PASSAGE FROM THE SEA OF MARMORA INTO THE SOUTHERN END OF THE BOSPHORUS STRAIT

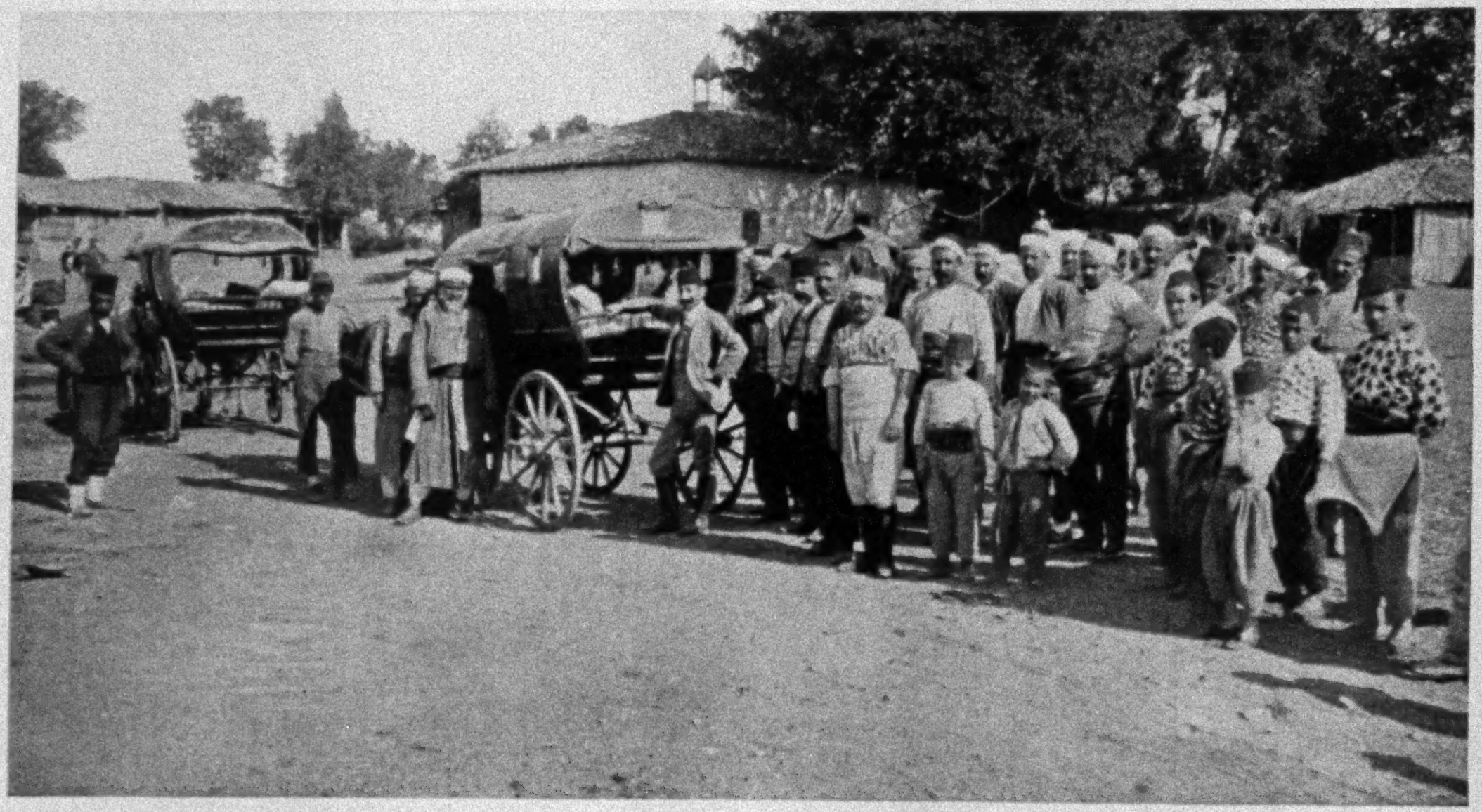


Photo by Ernest L. Harris

SCENE IN A GREEK VILLAGE ON THE EUROPEAN SHORE OF THE DARDANELLES

"The Dardanelles, or Hellespont, is a little more than twice as long and nearly twice as wide as the Bosphorus, varying from 1,400 yards to five miles. Its right, or European, shore is formed by the peninsula of Gallipoli, the Thracian Chersonese of the ancients, whose steep ridge overlooks the plain of Troy on the Asiatic bank and the broken foot-hills of Mount Ida" (see page 433).

counter-invasion under Alexander crossed the Dardanelles, in 334 B. C., crushing the Persians at the battle of the Granicus. That small stream, now known as the Bigha, flows into the Marmora half way between Cyzicus and the Dardanelles, at a spot associated in mythology with Priapus, god of gardens.

GLORIES THAT PASSED AWAY

It was in the period following the death of Alexander, when the kingdoms of Bithynia, Pergamos, and Pontus flourished in northern Asia Minor, that the cities of the Marmora began to take on their greatest importance.

Chief among them was Cyzicus, on the southeastern side of the peninsula of that name. Founded earlier than Rome or Byzantium, possessed at different times by Athens and Sparta, by the Persians and Alexander, by the King of Pergamos and the Republic of Rome, Cyzicus was long celebrated as one of the most splendid cities of the ancient world. Its gold staters were the standard of their time.

With the rise of Byzantium, however, its glory passed away. Goths and earthquake ravaged it; Constantine and the Turks found it an inexhaustible quarry for the public buildings of Constantinople. Today there is almost no trace of its marble among the vines and olive trees of the peninsula.

Nicomedia and Nicæa, in Bithynia, were also accounted no mean cities in their day. Indeed, Nicomedia, bequeathed to Rome with the rest of his kingdom by Nicomedes III, in 74 B. C., became for a moment, under the Emperor Diocletian, the capital of the world. As for Nicæa, it has three times been a capital. Nicæa, now Isnik, is not in all strictness a city of the Marmora, but the lake on which it lies is geologically a continuation of the Gulf of Moudania. A place of importance long after the Bithynian period, it is chiefly remembered today for the two councils of the church which took place there in 325 and 787.

In 1080 the Seljukian Turks seized it from the Byzantines and made it for a few years a capital whose brilliance rivaled Cordova and Bagdad. Reconquered by the Crusaders in 1097, it was, from 1204 to 1261, while the Franks were in possession of Constantinople, the capital of the Byzantine Empire. In 1330 it fell into the hands of its present owners, under whom it became famous again as the seat of the manufacture of the beautiful tiles that line the Turkish mosques and tombs of the sixteenth century.

A third Bithynian city, which we have already mentioned — Brusa — has more than one title to celebrity, not least among which is that its foundation was ascribed to the advice of no less a personage than Hannibal. At any rate, the great Carthaginian fled after the Punic wars to the court of King Prusias of Bithynia and committed suicide there, in 183 B. C., to escape falling into the hands of the Romans. Legend has placed his grave on the north shore of the Gulf of Nicomedia.

Space fails me to make even the barest catalogue of the cities of the Marmora that have enjoyed historical renown. I have already spoken of Rodosto (p. 443), to which Bulgarian raiders came in 813, in 1206, and in 1912, and where the Hungarian royal exile, Francis II Rakoczy, lived for 18 years and died in 1735. Another illustrious exile, Alcibiades of Athens, lived in another Samiote colony farther along the Thracian coast. This sleepy fishing village of Eregli, Heracleia Perinthos of old, was for a moment the administrative superior of Byzantium, when that city was destroyed by the father of Caracalla. A thousand years later Heracleia was given by the Emperor Michael Palæologus to the enterprising traders of Genoa.

More eastward still lies Silivri, the Athenian colony of Selymoria, which the Emperor Anastasius I made the terminus of the great wall he built across Thrace from sea to sea—precursor of the modern Lines of Chatalja. Lady Mary Montagu stopped there a night or two and mentions it in one of her Turkish letters. Then there is Chalcedon, now an Asiatic suburb of Constantinople, founded a few years earlier than Byzantium by colonists from Megara and renowned for the magnificence of its public buildings, for the councils of the early church which took place there, and for the memorable sieges

it sustained against Macedonians, Persians, and Saracens.

CONSTANTINOPLE

The history of the greatest city of them all has for nearly 2,000 years been the history of the little sea that lies before it. It was founded, a little later than Rome, by seamen from Megara. Always an important center of trade and long accounted one of the strongest cities of antiquity, it was not until Constantine, on that opposite shore of the Bosphorus where Xenophon camped with the remnant of his 10,000, conquered his last rival in 324 and became master of the Roman world, that Byzantium achieved its undisputed supremacy.

As the imperial city of Constantinople it remained for nearly a thousand years the true capital of the western world, the center of fashion, of art, of learning.

During that long period it was attacked by many an invader from East and West. It resisted them all until 1204, when it fell for a time into the power of the Franks and Venetians of the Fourth Crusade. The short-lived Latin dynasty was expelled in 1261, but Latins continued in possession of many parts of the Greek world and became the paramount power in the Marmora.

Their occupation has left its mark to this day in the Romaic Greek language and in the navigating terms of Greeks and Turks alike. The Genoese, obtaining a permanent foothold first at Heracleia and then in Galata, at the very gates of the capital, gained control of the Bosphorus, where the ruins of their two castles still exist at the mouth of the Black Sea, and of the Dardanelles. They built a stronghold at the narrowest part of the latter strait, on the Asiatic shore, at the point known today as Chanak Kalesi.

THE ADVANCE OF THE TURKS

The hold of the Genoese on the Marmora was shaken in 1306 by the Grand Company of Catalan mercenaries, originally hired by the emperor Andronicus II to oppose the incursions of the Turks. The Grand Company established itself at Gallipoli and played havoc with the traffic of the strait until it was dispersed in 1310; but the Turks continued to advance. These nomads of the East whose very name was unknown to the ancients had long been filtering into Asia Minor. They reached the Marmora in 1326, seizing Nicomedia and establishing their capital at Brusa.

Thirty years later they crossed the Dardanelles, whence they spread into Thrace, captured Adrianople, and penetrated the Balkans. After the battle of Nicopolis, in 1396, which made the invaders secure against European interference, Sultan Bajezid I tightened his grip on Constantinople and the Marmora by building forts at Gallipoli and on the Asiatic shore of the Bosphorus, at its narrowest point (see picture, page 439).

His plans were cut short by the invasion of Tamerlane, who nearly annihilated the growing power of the Turks. But no later than 1452 the great-grandson of Bajezid was able to build a second and stronger castle on the European shore of the Bosphorus, only seven miles from Constantinople (see page 439).

He thus disputed the control of the strait with Greeks and Genoese alike and at the same time established a base for his operations against the doomed city. The next year it fell into his power, and with it the last pretension of the Genoese to control the adjacent waters. To secure himself against surprise by sea, Mohammed II built another pair of castles at the narrowest part of the Dardanelles.

Since that time the Marmora, that storied lake of the Greco-Roman world, has been an essentially Turkish lake. But the Turks have never succeeded in giving it a purely Turkish atmosphere. Greek it was from the beginning of time and Greek it remains in great part today. The language of the towns, the cultivation of the vineyards, the navigation of the sea, are after 500 years of subjection more Greek than Turkish.

Since the Balkan war, accordingly, the Turks have attempted to remedy this state of affairs—by the simple process of expelling their Greek neighbors. From the European coast of the Marmora they have driven whole villages into exile and seized their lands, on the pretense that the Turks in Macedonia were so treated by the Hellenic authorities.

Photo by Ernest L. Harris

SCENE IN A GREEK VILLAGE ON THE ASIATIC SHORE OF THE DARDANELLES STRAIT

THE BLACK SEA

If the Black Sea lacks the charm of its southern neighbor, its physical features are on a scale befitting its greater size, and it forms the natural outlet for a territory of far vaster extent and commercial importance. Into it pour from different points of its low, northern coast four of the greatest rivers in Europe—the Danube, the Dnieper, the Don, and the Dniester—all of them longer than the Rhine and exceeded in length only by the Volga. Our own Mississippi, of course, is longer than any of them, having a course of 2,616 miles, while that of the Danube is 1,725.

Its greater depths—which are very deep indeed, sinking to 7,000 feet—contain no discoverable form of organic life, which does not prevent it, however, from harboring an astounding variety of fish. Like the Mediterranean, the Black Sea is also tideless, or imperceptibly tidal, and a strong surface current flows out of it through the Bosphorus, another one returning at a lower level.

Upon the eastern end of the Black Sea abuts the noble range of the Caucasus, loftier than any other in Europe and not unworthy to compare with the Rocky Mountains, the Andes, or even the Himalayas.

In contrast to the generally flat northern shore, the southern is a series of high and broken scarps that hold up the plateau of Asia Minor. These are largely wooded. In natural harbors the Black Sea is not well provided. In fact, the only landlocked anchorage is found in the Crimea.

But the Russians, the Rumanians, and the Bulgarians have improved their various ports, and from them lines of communication radiate by land and sea to every part of the world, tapping the great wheat and oil fields adjoining the Black Sea and the rich agricultural regions of Transcaspia. The Turkish coast is still innocent of harbors or railroads, although it does a considerable trade in foreign bottoms. It is one of the principal tobacco-growing districts of the world, besides exporting wool, gums, nuts, and other natural products.

The history of the Black Sea has always been associated with that of the lesser lake forming its outlet. The Greeks ventured into it at a very early period, bestowing upon it the name of

WINDMILLS AT EREGLI, ON THE EUROPEAN COAST OF THE MARMORA

Eregli was the ancient Heracleia Perinthos, founded by colonists from Samos in 597 B. C. Windmills are supposed to have originated in this part of the world. They are still to be seen on many a headland and hilltop of the Marmora and the Ægean.

Photos by H. G. Dwight

THESE SPRINGLESS CARTS ARE THE CHIEF MEANS OF CONVEYANCE THROUGHOUT ASIA MINOR

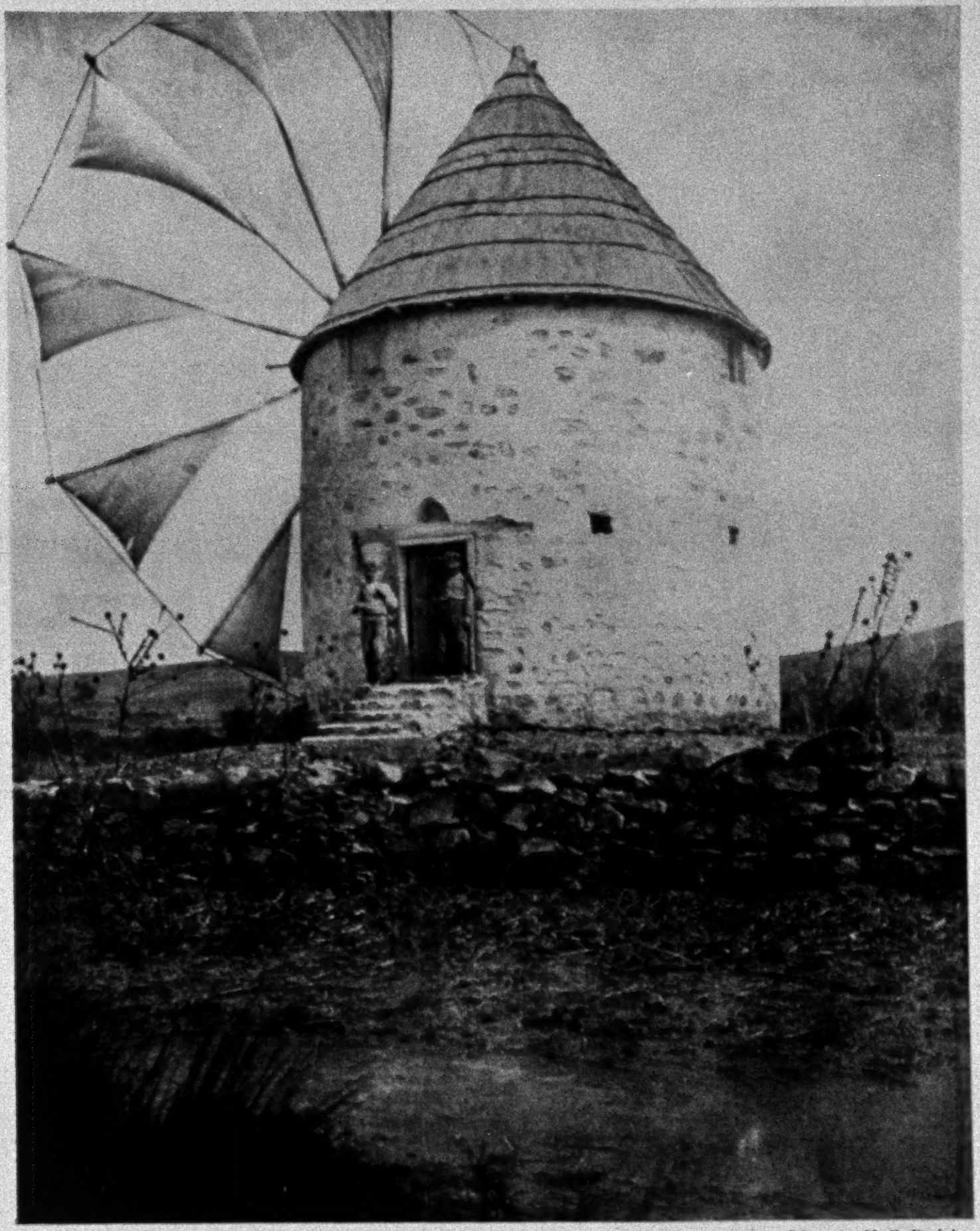
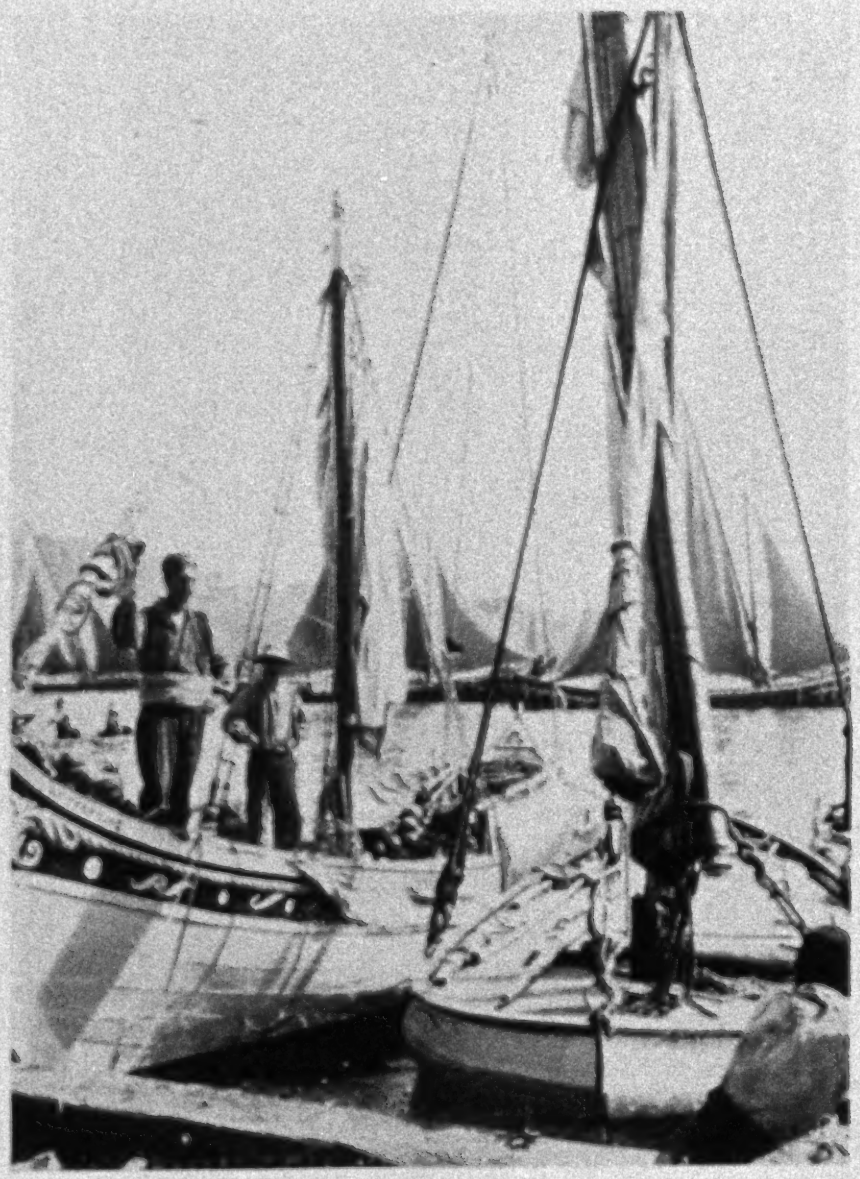


Photo by H. G. Dwight

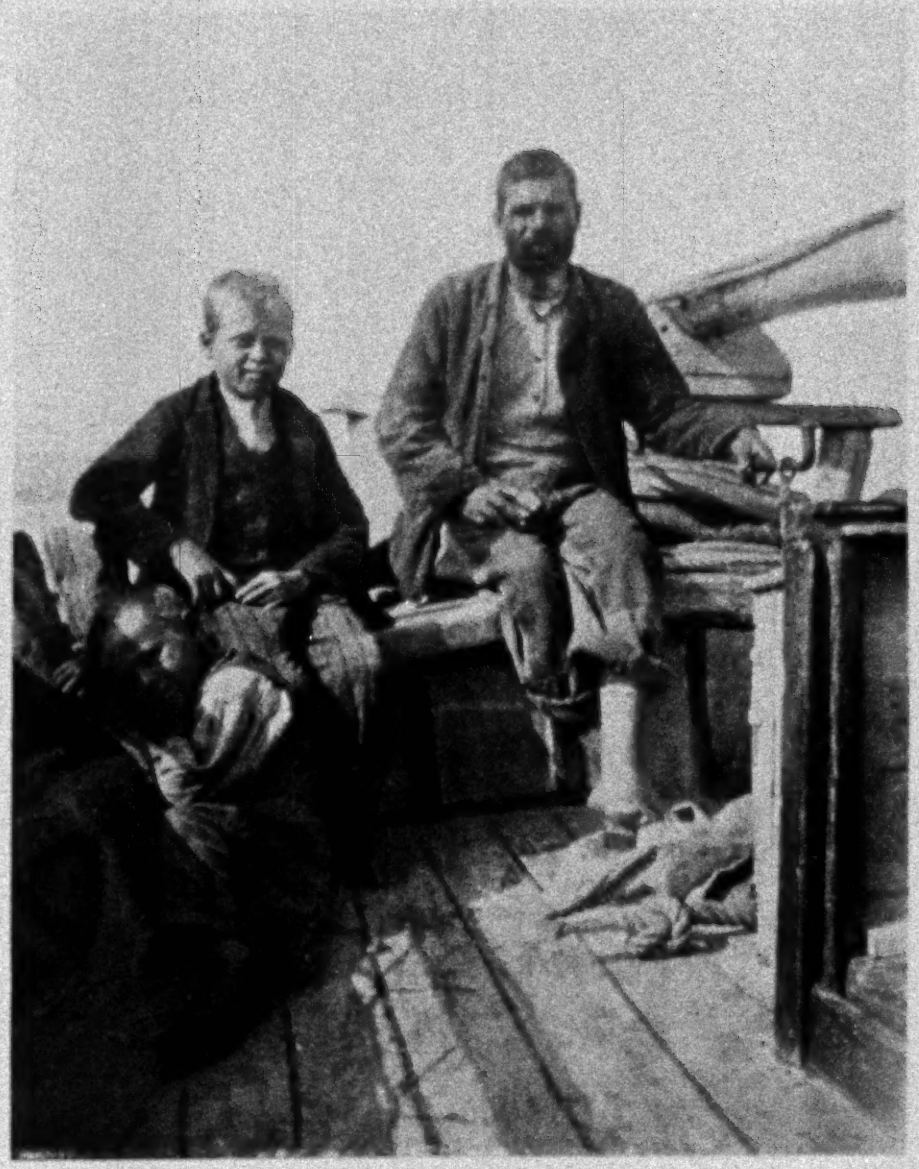
WINDMILL ON THE ISLAND OF PASHA LIMAN, IN THE SEA OF MARMORA

"In any other part of the world this inland sea would long ago have become a place of sojourn for yachtsmen and summerers, so happily is it treated by sun and wind, so amply provided with bays, capes, islands, mountains, forests, and all other accidents of nature that make glad the heart of the amateur explorer" (see page 436). This island contains perhaps the finest harbor in the Marmora. About its shores a French company cultivates grapes and nectarines and makes an excellent wine.

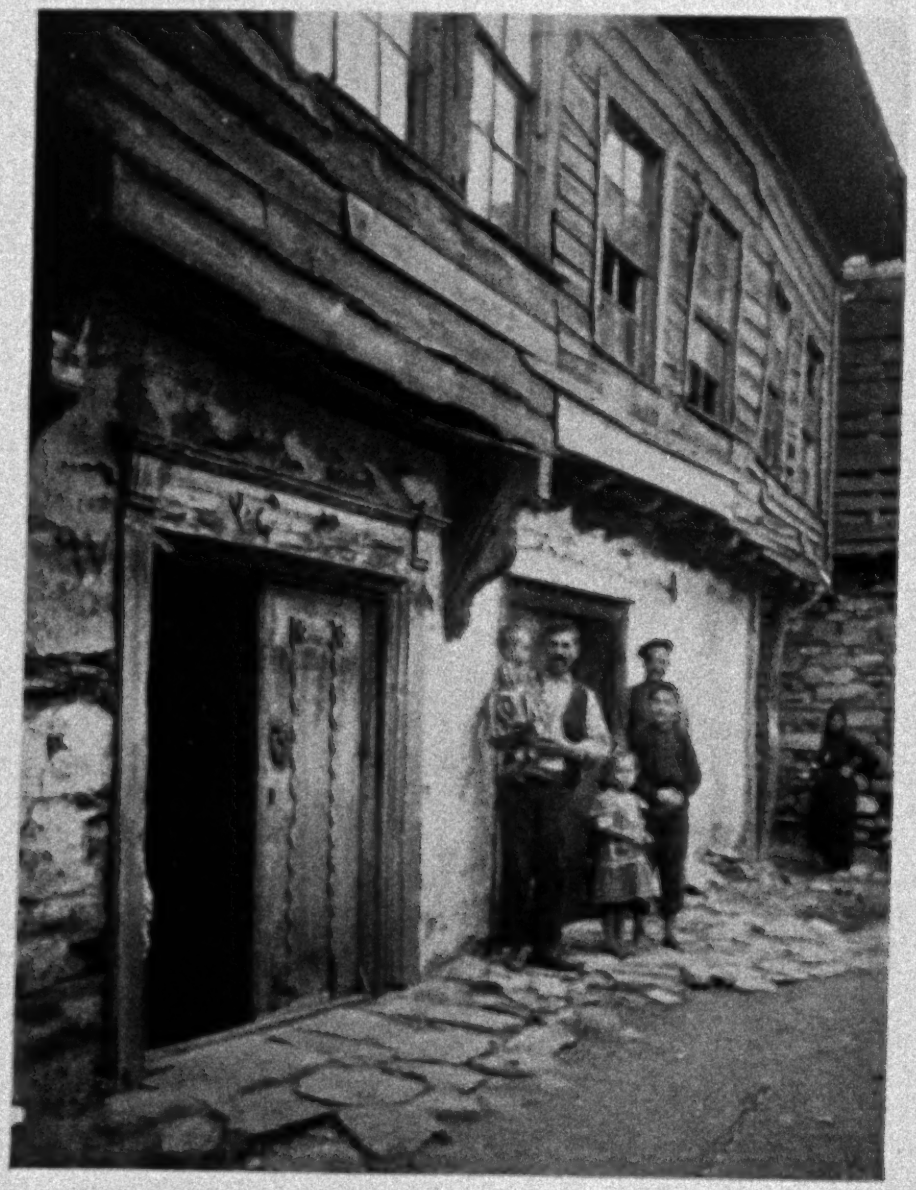


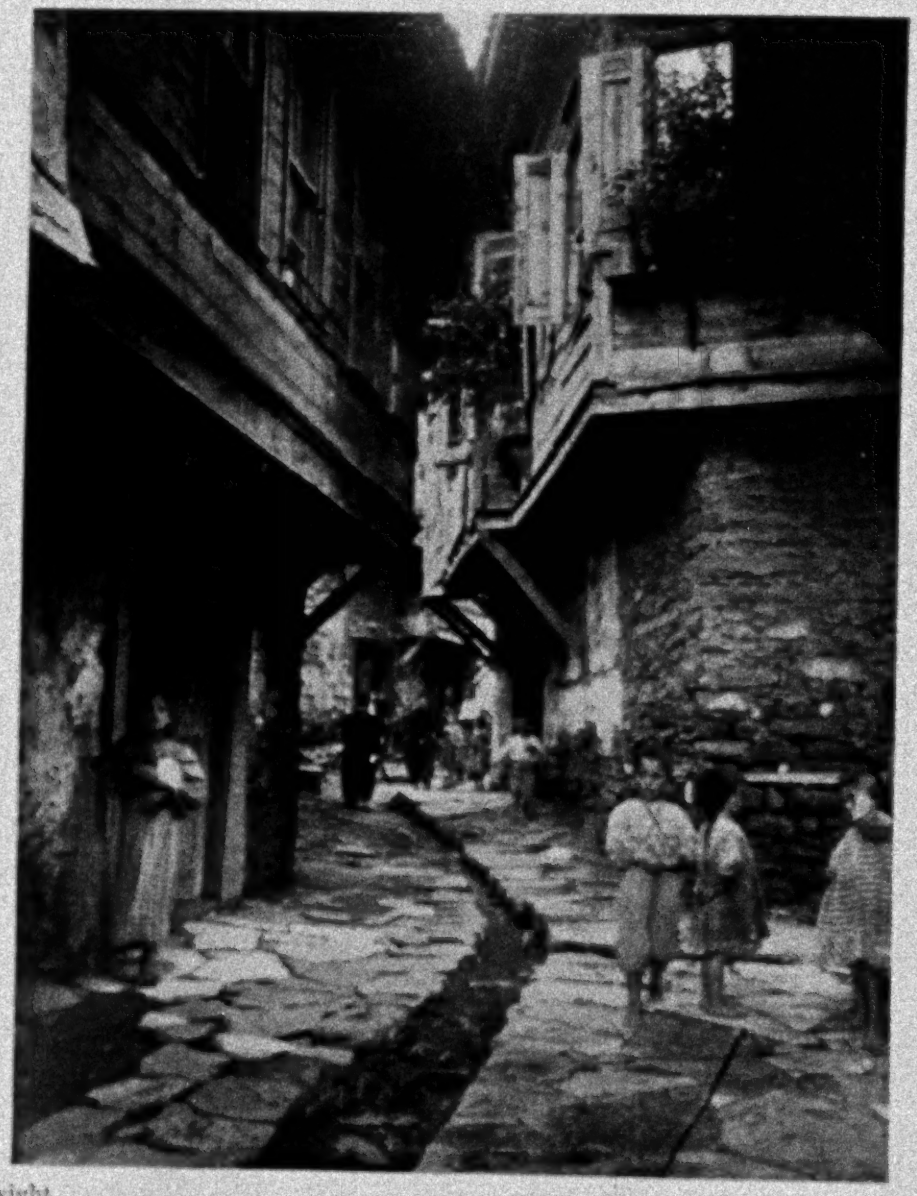
SAILING CAIQUES OF THE MARMORA

Photos by H. G. Dwight



A SEA-DOG OF THE MARMORA





Photos by H. G. Dwight

GREEK TYPES OF THE ISLAND OF MARMORA

"But the Turks have never succeeded in giving it a purely Turkish atmosphere. Greek it was from the beginning of time and Greek it remains in great part today. The language of the towns, the cultivation of the vineyards, the navigation of the sea, are after 500 years of subjection more Greek than Turkish" (see page 448).

A VILLAGE STREET ON THE ISLAND OF MARMORA

This island, the ancient Proconnesus, is almost a solid mass of marble ten miles long, and has for centuries been known for its quarries.

KERASSUND, ON THE BLACK SEA

"The Russians, the Rumanians, and the Bulgarians have improved their various ports, and from them lines of communication radiate by land and sea to every part of the world, tapping the great wheat and oil fields adjoining the Black Sea and the rich agricultural regions of Transcaspia. The Turkish coast is still innocent of harbors or railroads, although it does a considerable trade in foreign bottoms" (see page 449).

Photos by H. G. Dwight

TYPES OF SAILING VESSELS SEEN IN THE BLACK SEA

The Black Sea is about four times the size of our greatest lake. Lake Superior is 412 miles long by 167 wide, while the Black Sea has a length of 750 miles and a breadth of 385. That there is something dark and unfriendly about it is more than a legend (see page 435).

INEBOLI, ON THE BLACK SEA

Ineboli is the port of the rich agricultural and mohair district of Castambol. "Although the Black Sea now washes the shores of four nations instead of one, it has retained much of the character of a lake, and a Turkish one, from the fact that the Turks still control its outlet. We have seen how Greeks, Romans, Byzantines, Genoese, and Turks, one after another, have throughout the centuries exercised that right of control simply by virtue of a geographical accident" (see page 457).

Photos by H. G. Dwight

SAMSUN LIGHTERS

The lighters of each Turkish port differ a little in picturesqueness. Those of Samsun are the largest seen on the Black Sea coast, partly because steamers anchor farther offshore than elsewhere and partly because the commerce of Samsun is the most important. Samsun is the center of the tobacco industry in the Black Sea and the chief port for northern Asia Minor. English and French companies were surveying for a harbor and for a railway to tap the German Bagdad line when the war suspended their operations.

THE WATER FRONT OF TREBIZOND (SEE PAGE 457)

Photos by H. G. Dwight

LIGHTERS OF INEBOLI

"What the Allies are now seeking to teach them is that a double freak of nature does not necessarily fit them to be masters of the fate of other nations, and that in the eyes of the rest of mankind the defenses of one city are less important than free access to wheat and oil fields among the greatest in the world" (see page 459).

Euxinos, friendly to strangers, by a euphemistic interpretation of its real character. The country of the Golden Fleece lay in the romantic glens of the Caucasus, where also the Greek imagination set its greatest myth of Prometheus. And the littoral of the Black Sea was dotted with Greek colonies, whose ruins or whose modern successors exist today.

Like the Marmora, the Black Sea also had its post-Alexandrine and its Roman periods, when the Kingdom of Pontus flourished in the south and in the north Emperor Trajan founded his colony of Dacia (now known as Rumania). The Roman imprint still persists in the language and the faces of the Rumanian coast, where the poet Ovid died in exile. The Byzantine Empire left an even stronger mark, giving letters and a religion to the people of the Black Sea. Into those waters also penetrated the Genoese, planting along the south shore a chain of factories whose towers and escutcheons may still be seen in more than one sleepy Turkish town.

Then came the Turks, a century or so after they reached the Marmora. The fantastic little empire of Trebizond, erected by the Comneni after the capture of Constantinople by the Franks, survived the capture of Constantinople by the Turks. It was from the mountains behind that ancient Greek city that Xenophon and his returning ten thousand caught their historic first glimpse of the sea.

Trebizond owed to its position at the terminus of the time-honored caravan route from northern Persia and central Asia a prosperity taken from it only in our day by Batoum and the trans-Caucasian Railroad; but, like the neighboring Seljukian principalities and the Khanate of the Crimea, it fell at last into the hands of Mohammed II. And at the height of the Ottoman power—that is, during the last part of the fifteenth, the whole of the sixteenth, and the greater part of the seventeenth century—there was no coast of the Black Sea which the Turks did not directly or indirectly dominate. It became, like the Marmora, a Turkish lake.

Unlike the Marmora, however, it has not remained a Turkish lake. Its history has undergone an evolution of such nature that in this century we are more inclined to think of the Black Sea as a Russian lake; yet so recently as 200 years ago the Turks denied the right of the Czar to call himself an emperor!

Although the Black Sea now washes the shores of four nations instead of one, it has retained much of the character of a lake, and a Turkish one, from the fact that the Turks still control its outlet. We have seen how Greeks, Romans, Byzantines, Genoese, and Turks, one after another, have throughout the centuries exercised that right of control simply by virtue of a geographical accident.

Until 1774 Turkey was able to bar the Russian flag from the Black Sea, just as Russia bars the Persian flag today from the Caspian. The Treaty of Akkerman renewed and enlarged in 1826 the right of navigation of the Russians, and in 1833 the Treaty of Hunkyar Iskelesi bound Turkey to close the Dardanelles to foreign ships of war. This principle the Powers agreed in 1841 to respect, though that did not prevent their fleets from entering the straits to participate in the Crimean War.

The Treaty of Paris which followed that war declared the Black Sea neutral and closed to warships of any nation, including Russia; it also made free and put under an international commission the navigation of the Danube.

Russia, however, took advantage of the Franco-Prussian War to repudiate the clause of the Treaty of Paris relating to her own warships in the Black Sea; and her successful war against the Turks brought her, a few years later, within sight of the realization of her old dream of a free path to the ocean. But the British fleet took that occasion to enter the Marmora and to anchor off the Princes Isles, while the Russians camped at San Stefano; and the subsequent Treaty of Berlin further dashed the Russian hopes.

Since that time the case has remained more or less at a standstill, except that in 1891 the Russians obtained for their so-called volunteer fleet, which in reality are transports and auxiliary cruisers, the

Photo by H. G. Dwight

TURKISH GENTLEMEN OF THE OLD SCHOOL: CONSTANTINOPLE

right to pass the straits. Otherwise the Turks have allowed no foreign man-of-war to enter the Marmora unless under rare and special circumstances; and not only do they exercise surveillance over the traffic in the straits, but twice during the last four years they have closed the Dardanelles to navigation of any kind.

At the moment at which I write the fleets of France and England are hammering at that historic gateway. Thus the question of the Black Sea, which is the ancient question of the straits, is posed anew, more dramatically than ever before. Is it for a final solution? No solution can be final, however, which will give any one nation an absolute right of control over the Bosphorus and the Dardanelles.

The Russians believe that they have every right to insist that they be not throttled at the gate of their own house. The rapidly increasing development of their railways, their industries, their agricultural and mineral resources, both in Europe and beyond the Caspian, make it imperative, they contend, for them to have the freedom of their own front door.

But while the Black Sea becomes every year a more important highway, and while the Russians are the preponderant power in the Black Sea, they are not the only power. They have a neighbor to whom it seems even more vital that the straits be open.

For Rumania has no back door upon another sea. And if Rumania happens to be small, that is no reason why Rumania should be throttled. Bulgaria is also interested in the matter, though less so since she gained an outlet into the Ægean;

and so to a degree are Servia and Hungary, who have access to the Black Sea through the Danube. Even the Turks deserve to have a voice in the matter.

What the Allies are now seeking to teach them is that a double freak of nature does not necessarily fit them to be masters of the fate of other nations, and that in the eyes of the rest of mankind the defenses of one city are less important than free access to wheat and oil fields among the greatest in the world. But if the Turks shall learn that somewhat bitter lesson they will still remain neighbors to the Black Sea and the Sea of Marmora, and concerned in their future accordingly.

The question is so great, it involves so many interests, the industry of such vast territories, the destiny of so many million people, that it should have no petty or partial answer.

CONSTANTINOPLE AND SANCTA SOPHIA

By Edwin A. Grosvenor

The following article is abstracted from "Constantinople," two volumes, by Dr. Edwin A. Grosvenor, of Amherst College, published and copyrighted by Roberts Brothers and Little, Brown & Company some years ago, but now out of print.

IN THE word "Constantinople" there is the blended magic of mythologic romance, history, and poetry. It is the synonym of the fusion of races and the clash of creeds. More than any other capital of mankind it is cosmopolitan in its present and its past. From the natural advantages of its site it is the queen city of the earth, seated upon a throne.

After the treaty of Tilsit, Napoleon bade his secretary, M. de Méneval, bring him the largest possible map of Europe. In anxious and protracted interviews the Emperor Alexander had insisted upon the absolute necessity to Russia of the possession of Constantinople. There was no price so great, no condition so hard, that it would not have been gratefully accorded by the Russian czar for the city's acquisition. Napoleon gazed in silence earnestly and long at the map wherein that continent was outlined, of which he, then at the zenith of his power, was the autocratic arbiter. At last he exclaimed with earnestness, "Constantinople! Constantinople! Never! It is the empire of the world!"

THE EARTH'S GREAT-CITY BELT

The dome of Sancta Sophia is 41° north of the equator and 28° 59′ east of Greenwich. It is remarkable that so many cities of first importance are situated on the same great parallel. That narrow belt, hardly more than 90 miles in breadth, which encircles the globe between 40° 20′ and 41° 50′ in north latitude, includes Constantinople, Rome the Eternal City, Madrid, the political and literary capital of Spain, and on this side the ocean the two metropolises, unrivaled in the Western Hemisphere, New York and Chicago. A person proceeding directly east from the Court-house Square in Chicago would ascend the slopes of the Palatine Hill in Rome. One traveling directly east from New York City Hall for a distance of 5,622 miles would pass through the southern suburbs of Constantinople.

ALL RACES ARE REPRESENTED HERE

The resident population today can be but little less than one million. Like the audience that listened to St. Peter on the day of Pentecost, they are "out of every nation under heaven."

To say that there are 450,000 Mussulmans, 225,000 Greeks, 165,000 Armenians, 50,000 Jews, and 60,000 members of less numerous subjects of foreign nationalities is to give only an approximate and faint idea of the motley host who sleep each night in the capital of the Sultan. The endless variety of facial type, of personal attire, and of individual demeanor, and the jargon of languages in some gesticulating crowd afford more

Photo by H. G. Dwight

ALBANIANS IN CONSTANTINOPLE

The resident population today can be but little less than one million. Like the audience that listened to St. Peter on the day of Pentecost, they are "out of every nation under heaven" (see page 459)

distinct and more exact details than any table of statistics, however elaborate and dry.

In the polyglot multitude, he who speaks but a couple of languages is considered ignorant and is often helpless. The common handbills and notices are usually printed in four. The sign over a cobbler's shop may be painted in the languages of six different nations, and the cobbler on his stool inside may in his daily talk violate the rules of grammar in a dozen or more. Still the resident who is possessed of four languages will almost always be comfortable and at ease.

First in importance is his own vernacular; then French, for intercourse with the high Ottoman officials and for general society; then Turkish, for dealing with the humbler classes; and Greek, as an open sesame among the native Christian population. Howsoever many additional languages one can speak—Italian, Russian, English, German, Arabic, Armenian, Persian, or a dozen besides—they are not superfluous, and on occasion each will be of advantage and use.

A DISAPPOINTING CLIMATE

The only disappointing thing at Constantinople is the climate. Only rarely does it correspond to the city's natural loveliness. Constantly it contradicts those conceptions wherein imagination pictures the East:

"The land of the cedar and vine,
Where the flowers ever blossom, the beams ever shine;
Where the citron and olive are fairest of fruit,
And the voice of the nightingale never is mute;
Where the tints of the earth and the hues of the sky,
In color, though varied, in beauty may vie,"

Photo by H. G. Dwight

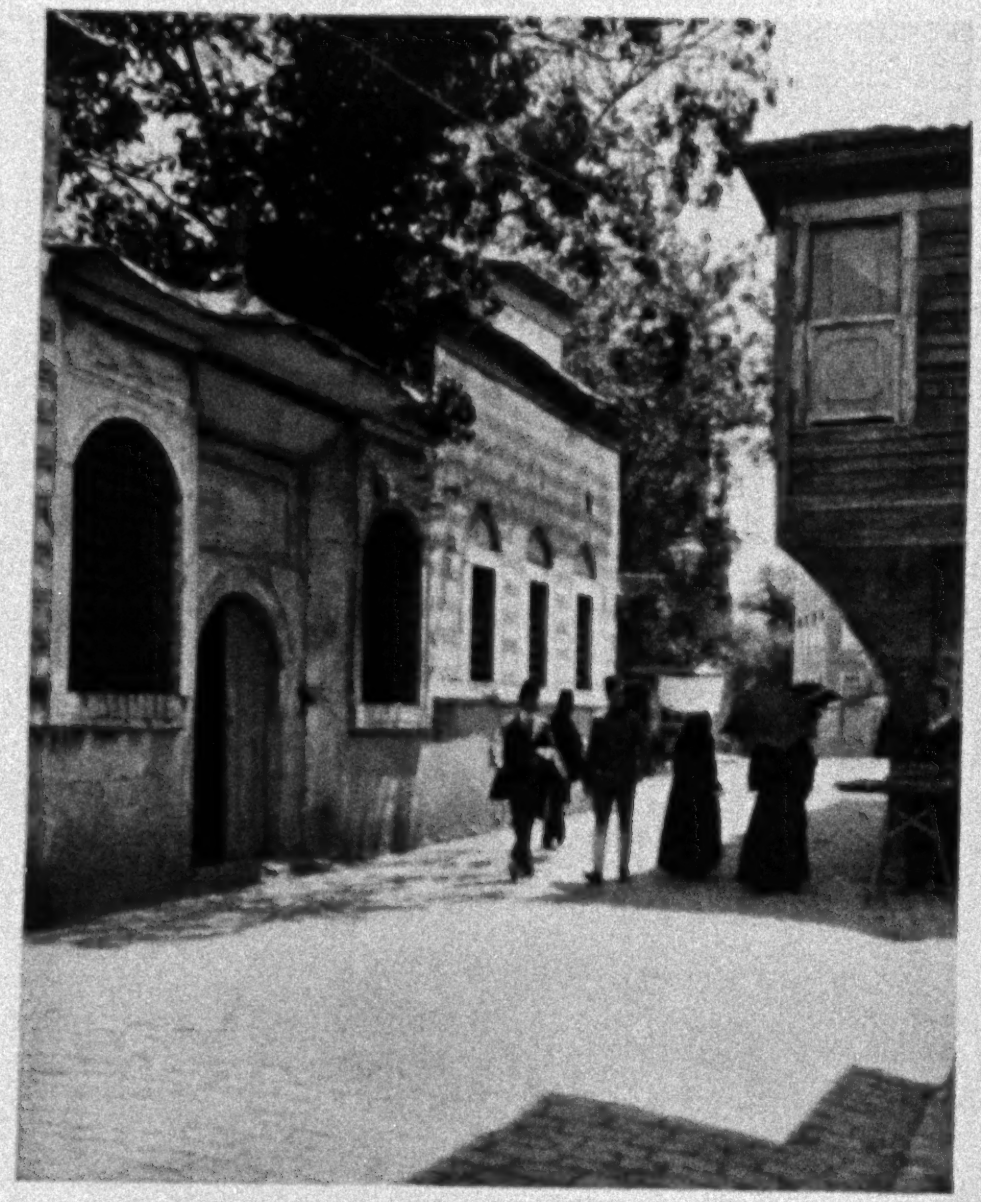
A GREEK PEASANT WOMAN OF THE MARMORA: CONSTANTINOPLE

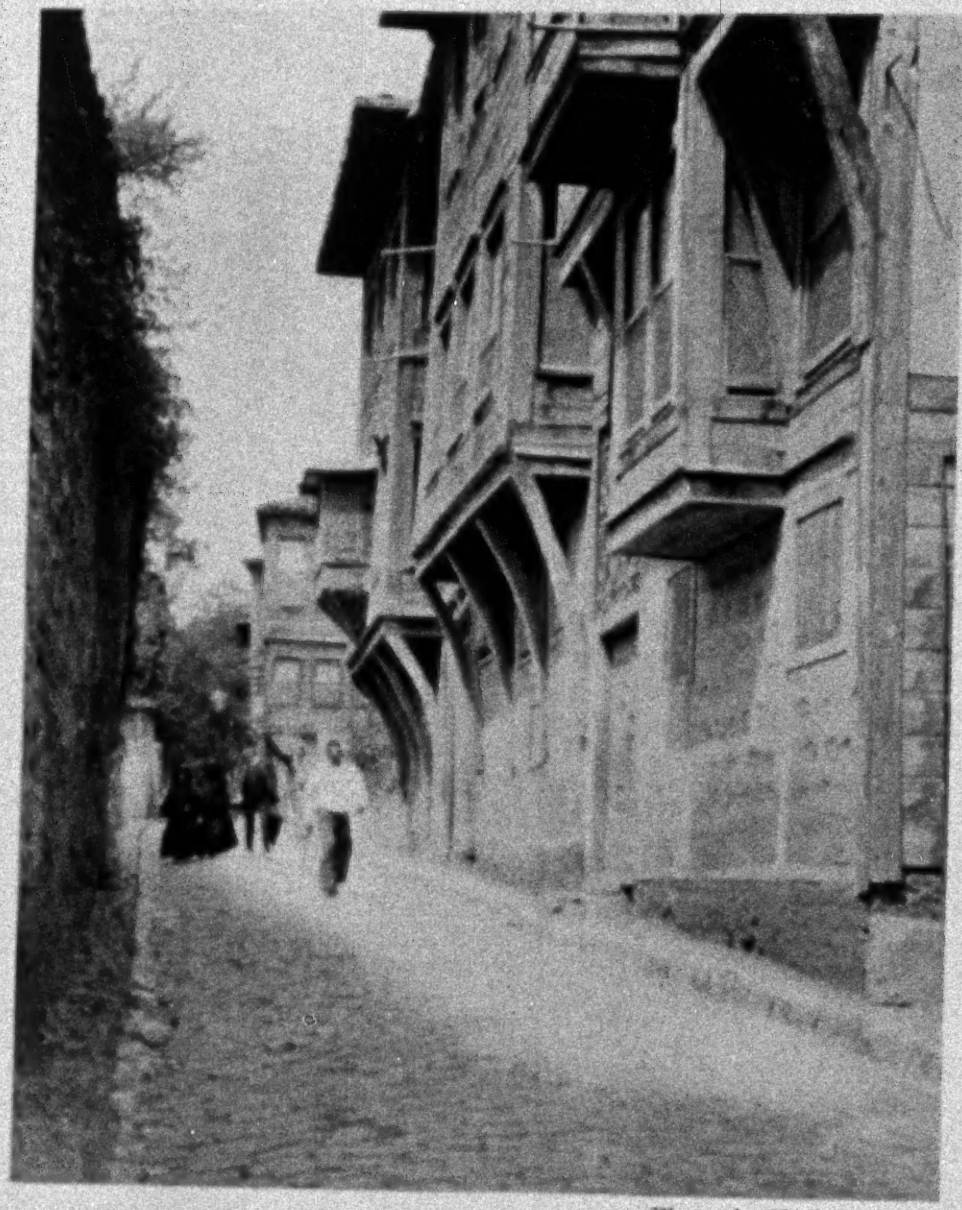
is, as to the deliciousness of its climate, only the fond creation of a poet's brain. Some days in April or May or June seem absolute perfection and leave nothing for full satiety to dream of or wish. October or November or December is sometimes beautiful, and scattered through the year are many pleasant days; but, taking the twelve months through, few localities possess a climate more capricious and unkind. The variations in temperature are frequent, sudden, excessive, and dangerous. The experience of one year forms small basis for calculation of the next. The heat of summer is often maintained for months at a high temperature; meanwhile no rain moistens the baked and cracking ground and the night is hardly less parching than the day. Snow sometimes falls in winter, but the ground rarely freezes, becoming instead a mass of adhesive mud, which is rendered still more disagreeable by incessant rains. The damp and clammy winter never invigorates like the sharper season of New England.

Topographical position between the Black Sea, the Marmora, and the Ægean largely affects the climate. The swift Bosphorus, bounded by sharply descending banks, becomes a tunnel for shifting currents of air. Old habit lingers and the American resident speaks of the four seasons; nevertheless the remark of Turner is literally true: "There are two climates at Constantinople, that of the north and that of the south wind."

All the vicinity of Constantinople is subject to earthquake. Hardly a year passes without several shocks. These have generally been slight and of brief duration. The most violent in recent times occurred July 11, 1894, and destroyed nearly a hundred lives. In ancient times they were often long-continued and frightfully disastrous.

The seven hills, which were to Constantine and the cohorts the admired reminder of the older Rome, may still be distinctly traced. Though the topography has been vastly modified since 330, though frightfully devastating fires have caused the city to be rebuilt from its foundations on an average of once every 50 years—that is, more than 30 times since it became an imperial capital—though the valleys have been partially filled and the crests, never more than 300 feet in height, have been worn away, yet the seven proud hills are there. They

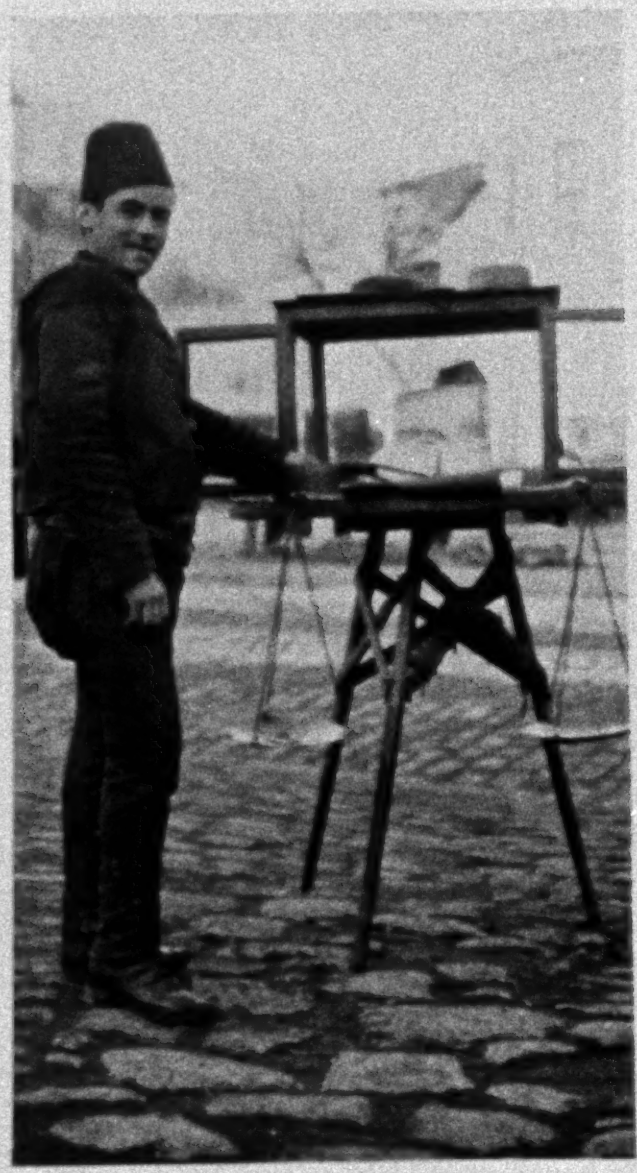




THE LATTICED WINDOWS OF TURKISH HOUSES IN CONSTANTINOPLE

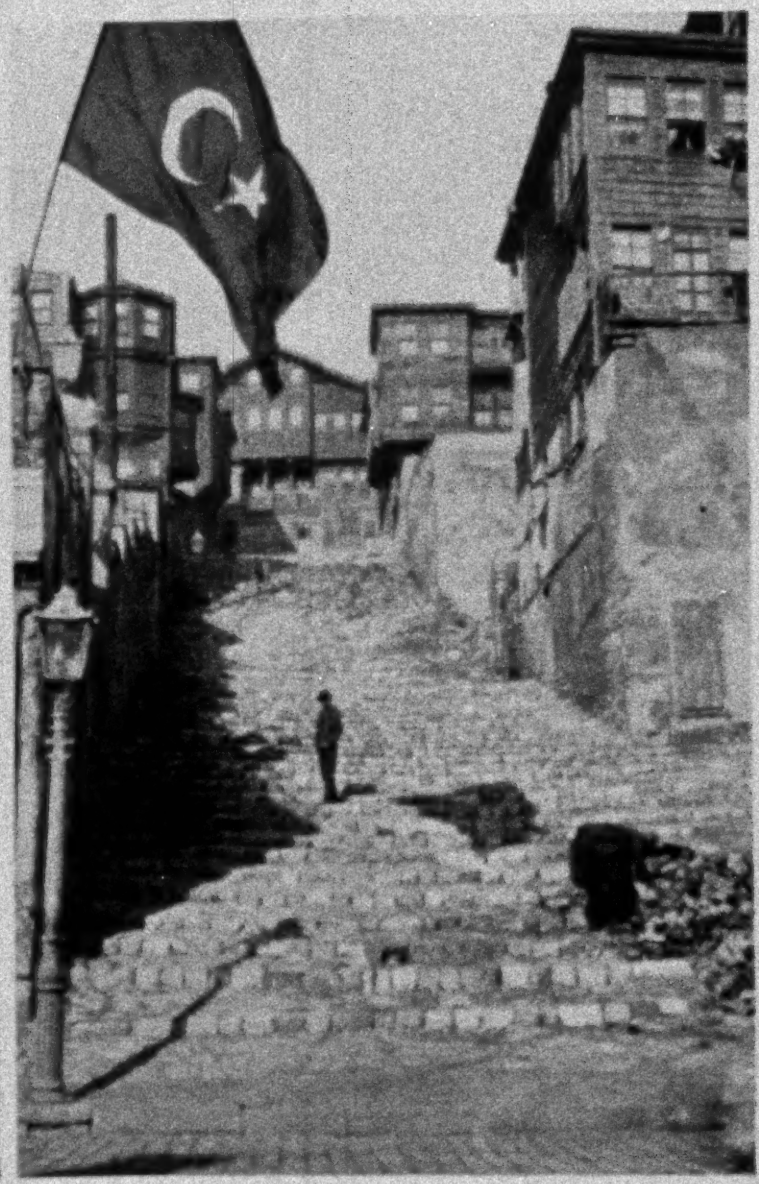
Photos by H. G. Dwight

"The amusements of a Turkish lady we should consider rather mild. She is seldom intellectual; therefore her pleasures are not intellectual. She is not athletic even in her youth. She plays no games, such as bridge, whist, or dominoes, although Turkish men are fond of games of chance. She does not become absorbed in fancy work. . . . What, then, does she do? For the most part she *sits*. The Turkish verb to *sit* is constantly used where we should say *stay* or *live* or *visit*. For instance, to the question, 'Where are you living?' one gets the response, 'I am sitting in Stamboul.' And this is literally true. All Oriental women occupy an enormous proportion of their time in sitting. And when they sit it is not in the restless way that we have, but with the hands idly folded in the lap, in the perfect repose of a sleeping cat, often for hours without even conversation."—From "Behind Turkish Lattices," by HESTER DONALDSON JENKINS, Lippincott Company.



CANDY VENDER

A TURKISH BARBER



Photos by Mortimer J. Fox

STREET IN CONSTANTINOPLE

are at once distinct elevations and great ridges which blend at their tops. It is not everywhere easy to distinguish the valleys between the first, second, and third hills, since there man has most modified nature.

Few cities have equaled Constantinople in importance. None in ancient or modern times have exceeded it in dramatic interest. During centuries of the Middle Ages it was the foremost city of the world, surpassing every other in populousness, strength, and beauty and in the high development of its civilization. To the Mussulman it ranks next to Mecca, Medina, and Jerusalem. The Christian must regard it with still greater reverence. It was the first city distinctively Christian, erected by the first Christian emperor on the ruins of vanquished paganism.

COUNCILS OF THE UNDIVIDED CHURCH

Here, almost in sight of the dome of Sancta Sophia, was wrought out the theology of the undivided church by her ecumenical councils. Here, in the fourth and fifth centuries, preached that galaxy of pulpit orators, the Chrysostoms and Gregorys, who in biblical and pious eloquence have never been surpassed. Here, ever since its foundation, is the chief seat of that venerable communion which alone of Christian churches uses no mere translation, crude and imperfect, of the Gospels in its worship, but the vernacular of whose ritual is even now daily chanted in the very language in which the New Testament was inspired. Here were developed the first principles of Byzantine art, which as handmaid of the Christian faith "has had more influence than any other in the church architecture of western Europe." Here was framed that marvelous Justinian Code, digest and compendium of all the laws known before, which, however modified, still survives and sways in all subsequent legislation. Here, in cloisters and libraries, while Europe was buried in barbarism, were preserved the precious volumes, and among her sons were being nursed the world-famous teachers to whom in their subsequent dispersion is commonly attributed the intellectual revival—the Renaissance.

During more than eleven hundred years after her consecration by Constantine, Constantinople yielded but once to foreign attack, when in the thirteenth century she was sacked by the Latin Crusaders. Many times assaulted by Persia, which, resurrected under her Sassanide kings, had reached a height of prosperity and power ancient Persia hardly attained; by the Arabs, in all the fiery glow of a new and till then triumphant faith; by innumerable hosts constantly renewed, of Goths, Avars, Bulgarians, and Slavonians—enemies as powerful and relentless as ever thundered at the gates of Rome—Constantinople vanquished them all, surrendering only at last to Sultan Mohammed II and the Ottomans. No other capital presents so sublime a spectacle during the Middle Ages. Alone of all the cities of Europe, she towered erect, unsubmerged amid the wild torrents of invasion. This record is the highest tribute both to the preëminent superiority of her position and to the skill and heroism of her sons.

THE UNRIVALED BOSPHORUS

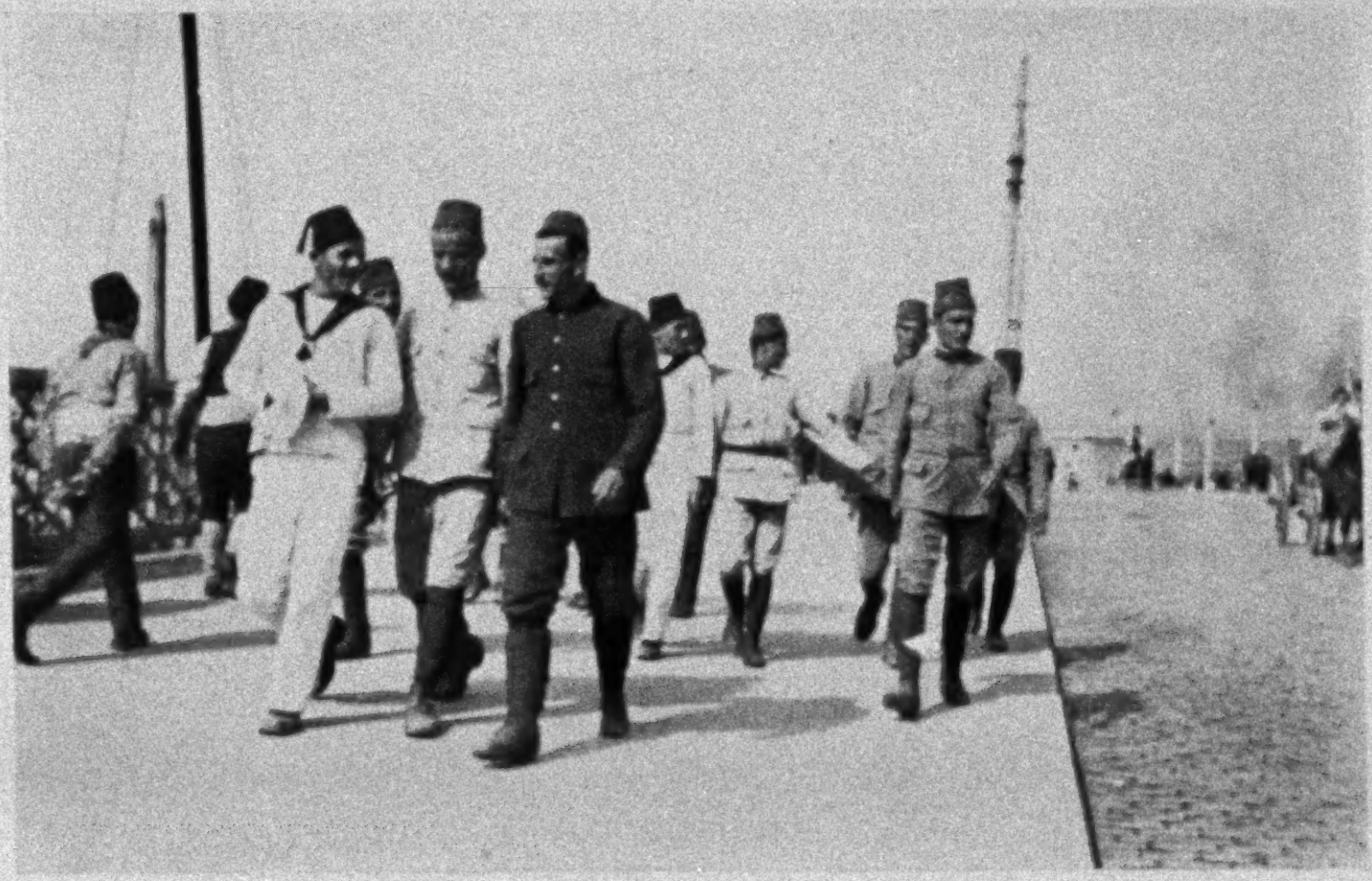
Although

> "The world is rich in streams
> Renowned in song and story,
> Whose waters murmur to our dreams
> Of human love and glory,"

there is not one among them all which rivals the Bosphorus, on whose banks the great capital is located.

To its associations it owes in part its undisputed preëminence. There is hardly a nation of the civilized world whose blood has not mingled with its waters. There is hardly a faith, hardly a heresy, which by the devotion of its adherents and martyrs has not hallowed its banks. Associations the most dissimilar, the most incongruous, the most distant, elbow one another in its every hamlet and village. The German Emperor, William II, in 1889 disembarks at the same spot which tradition makes the landing place of that other youthful leader, Jason, with his Argonauts, in that sublime voyage of the fourteenth century before Christ.

So sharply do its submarine banks descend that large vessels hugging the land too closely, though in deep water, often



TURKISH SOLDIERS AND SAILORS: CONSTANTINOPLE

Photos by H. G. Dwight

ISLANDERS OF THE MARMORA: CONSTANTINOPLE

"In the polyglot multitude, he who speaks but a couple of languages is considered ignorant and is often helpless. The common handbills and notices are usually printed in four. The sign over a cobbler's shop may be painted in the languages of six different nations" (see page 460).

Photo from Edwin A. Grosvenor

ONE OF THE MODERN MOSQUES IN CONSTANTINOPLE, THE MOSQUE NOURI OSMANIEH, COMPLETED IN 1754

"It is remarkable that so many cities of first importance are situated on the same great parallel. That narrow belt, hardly more than 90 miles in breadth, which encircles the globe between 40° 20′ and 41° 50′ in north latitude, includes Constantinople, Rome the Eternal City, Madrid, the political and literary capital of Spain, and on this side the ocean the two metropolises, unrivaled in the Western Hemisphere, New York and Chicago. One traveling directly east from New York City Hall for a distance of 5,622 miles would pass through the southern suburbs of Constantinople" (see page 459).

run their bowsprits and yards into houses on the shore. Many a shipmaster has paid damages for such unceremonious intrusion not only of his rigging, but of his sailors, into drawing-rooms and chambers along the Bosphorus. I remember, when making a good-by call upon an English lady at Candili, her matter-of-fact apology for the torn casements of the windows and the disordered appearance of the room. She said that a Greek vessel ran into the house that morning, and that the carpenters had not come to make repairs (see page 438).

A NARROW WATERWAY

The Bosphorus contains few dangerous submarine rocks or shoals. The locality of these few is indicated by lighthouses or buoys. The water is only slightly tinged with salt and is marvelously clear. The sands, glittering apparently near the surface, may be 20 feet below.

On a map of whatever scale, each of those familiar straits, which cleave lands and continents asunder, seems hardly more than a silvery thread. Yet, as one sails over their famous waters, the opposing shores on either hand sometimes appear far away. The Strait of Gibraltar, which wrests Africa from Europe, is 16 miles wide; that of Messina, forcing its way between Italy and Sicily, is from 2 to 12; that of Bonifacio, which, like a blade of steel, cuts Corsica and Sardinia apart, is 7 miles in width at its most contracted point; even the Dardanelles expands from over one mile to four.

But the illusion as to distances created by the map is reality as to the Bosphorus. Off Buyoukdereh, where it attains its largest breadth, its hemmed-in waters broaden to only 9,838 feet, or about one and four-fifths miles. Between Roumeli Hissar and Anadoli Hissar they shrink to one-sixth of these dimensions, or to 1,641 feet (see page 439).

THE BATTLE OF THE WINDS

By a strange phenomenon, if the south wind prevails the superficial current is reversed, though the inferior current continues its accustomed course. Then the waters on the surface are piled tumultuously back upon one another, and the quays, which are several feet above the ordinary Bosphorus level, are flooded and perhaps made impassable. At such times caiques and smaller boats do not dare to venture upon the tempestuous surface.

Sometimes a strong wind blows northward from the Marmora, and another wind as strong blows with equal violence southward from the Black Sea. Then, as one gazes from some central point like Roumeli Hissar, he beholds ships under full sail majestically approaching each other from both directions till at last they are only two or three miles apart. Between them lies a belt of moveless sea, into which they are forced and on which they drift helplessly about and perhaps crash into each other's sides. This is a duel royal between Boreas and Notus and may continue for hours. Gradually the zone of calm is forced north or south. At last one wind withdraws like a defeated champion from the arena. The ships which it has brought thus far drop their anchors and wait, or else hire one of the numerous steam-tugs which are paddling expectantly about. The ships which have come with the victorious wind triumphantly resume their course, and meanwhile their sailors mock and jeer their fellow-mariners, whose breeze has failed them.*

Of all its many descriptive epithets, ancient and modern, none have clung with more persistent tenacity than the simple, early adjective of "fishy" Bosphorus. Seventy edible varieties of fish, familiar to connoisseurs, sport in its waters. Some have their permanent haunts within the stream. The most are migratory. The instinct of the seasons moves them northward or southward with the birds. The strait is their only possible highway between the Black Sea and the Mediterranean, their summer and winter homes. From March until June and from August to December men, poised in the quaint perches high on piles above the water and constantly on the outlook, watch for the flash of their glid-

*The average annual temperature of the water is about 1½° Fahrenheit higher than that of the air. In winter it is 14½° higher; in spring, summer, and autumn it is 3¼°, 4°, and 1¾° less.

ing forms. The various fishy tribes, at intervals of days and in countless shoals, succeed one another. The watchers, trained by long experience, with sharp eyes pierce the crystal depths and know what fish are passing or are almost come. Then, the signal given, every advantageous spot is quickly blackened over with hundreds of fishing-boats, and their generous harvest never fails.

Would some Izaak Walton ask what are the classes and the habits of the swimming creatures, which thus today within the Bosphorus fall victims to the hook or spear or net? All this Aristotle best describes in his treatise upon the "Fishes," which he wrote more than 2,200 years ago.

"WHERE IS SANCTA SOPHIA?"

The first questions every stranger asks as his steamer rounds Seraglio Point from the Mormora or descends the Bosphorus from the Black Sea are: "Where is Sancta Sophia?" "Which is Sancta Sophia?" To catch the earliest possible glimpse of its outline the eye of every traveler is strained. Myths and legends told concerning it are devoured with eager interest. With rapt attention its walls and pillars and arches and mosaics are scanned. In after years, in the quiet of the stranger's home, it is the colossal form of Sancta Sophia which stands out most distinct on the canvas of Constantinople memories.

Nor is it strange. To many Constantinople means nothing but Sancta Sophia. To thousands who have never even heard of the city's wonderful walls, and who have never made a mind-picture of the Bosphorus, the name of its venerable cathedral is a familiar sound. Even to those who know it least it is the synonym of what is grandest, most glorious, most historic, and most sacred in the achievements of Christian architecture.

In one respect Sancta Sophia is unlike every other antiquarian monument of Constantinople. Those other antiquities of the city belong wholly to the past and have no future. The battered Theodosian walls can never withstand the shock of war again. Up the broken Serpent of Delphi, in the Hippodrome, no oracular response will ever pass to some future suppliant. Their part in the world's history is done. They are ancient, classic, hoary; but with each day becomes more remote the age for which they were formed and the purpose for which they were designed.

Sancta Sophia belongs to the past as well. In 537, a whole generation before the birth of Mohammed the Prophet, its great dome swept heavenward as skylike as it does today; yet that church, we may believe, has a future as glorious as, perhaps more glorious than, its past.

MOHAMMED II AT HIS GREATEST

Sultan Mohammed II was never more profund, more philosophic, more truly great, than on the day of conquest. An Ottoman soldier, in the intoxication of victory or fanaticism, was destroying the mosaics in Sancta Sophia with his mace. "Let those things be!" the Conqueror cried. With a single blow he stretched the barbarian motionless at his feet. Then, in a lower tone, he added, so the historian declares, "Who knows but in another age they may serve another religion than that of Islam?" What the future of this cathedral is the wildest speculation cannot grasp. In the legend of the common people, a Greek priest was celebrating the liturgy when the exultant army of the Sultan burst through the doors. Taking the cross in his hand, the priest slowly withdrew to one of the secret chambers, and there, with the cross, is waiting still.

The Church of Sancta Sophia rises on the crest and western side of the first hill. It stands just outside the limits of ancient Byzantium. Today its confused and shapeless pile, bounded by four massive minarets, encased in gigantic buttresses, made grotesque by wide painted stripes of alternate yellow and white, fills the horizon of the eye from every direction.

HISTORY LIKE ST. PETER'S

Like Saint Peter's at Rome, it traces its history by an unbroken chain back to Constantine himself. It is a fit coincidence that those two cathedrals—one of the vastest sanctuary of Western Cathol-

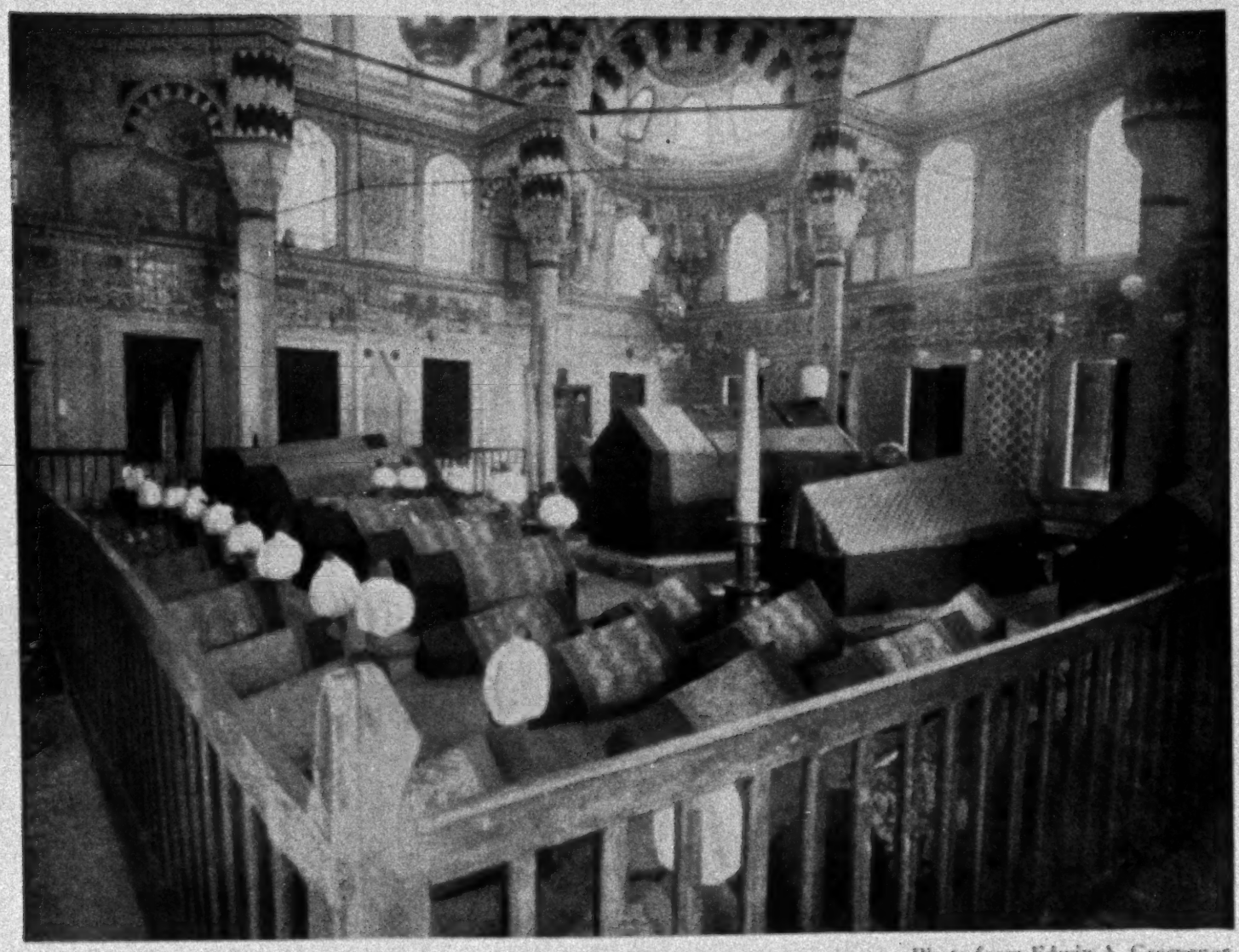


Photo from Edwin A. Grosvenor

THE MAUSOLEUM OF SULTAN SELIM II AT CONSTANTINOPLE

Beside the Sultan is his favorite wife, Nourban Sultana. Under the same roof lie his three daughters; also the five sons—Mohammed, Souleiman, Moustapha, Djeanghir, and Abdullah—all bowstrung in that same dreadful night by their brother, Mourad III, on his accession. Here, too, are the remains of twenty-one daughters and of thirteen sons of their brother and murderer.

icism and the other of Eastern Orthodoxy—should both have been first erected by the first Christian emperor. It is another coincidence that neither was intended by its founder to be the metropolitan church of either the new or the ancient Rome. That distinction in Constantinople was intended for the Church of Saint Irene, and in Rome for that of Saint John Lateranus.

Its foundations were laid in 326, on the site of a pagan temple, in the presence of Constantine himself, a few months after his return from the Council of Nice.

It was concentrated to the divine Sophia, or Wisdom of the Logos, or Word of God—that is, to Christ himself.

When it was destroyed by fire in 532, Justinian determined to restore it on a scale of magnificence such as the world had never beheld. It should be expiation in stone of his own mistakes and sins as a sovereign. It should commemorate the overthrow of disorder and rebellion and the pacification of the capital and Empire. In it his own glory should be embodied, and succeeding ages should there behold the enduring monument of his reign. It should preserve as well the memory of his Empress Theodora, whose noble courage had saved his imperiled throne, whose image was stamped with his upon every coin, and whose name was joined with his in every decree. It should be worthy of them, its founders and—as far as lay in seemingly limitless human resources and in the highest human skill—of the Saviour for whose worship it was designed.

Photo from Edwin A. Grosvenor

THE HISTORIC LAND WALLS OF CONSTANTINOPLE WHICH FOR 1,000 YEARS DEFIED COUNTLESS ASSAULTS (SEE PAGE 464)

Around the land walls stretched the moat, which was from 60 to 70 feet wide and nowhere less than 30 feet in depth. It was lined on both sides by walls of hewn stone

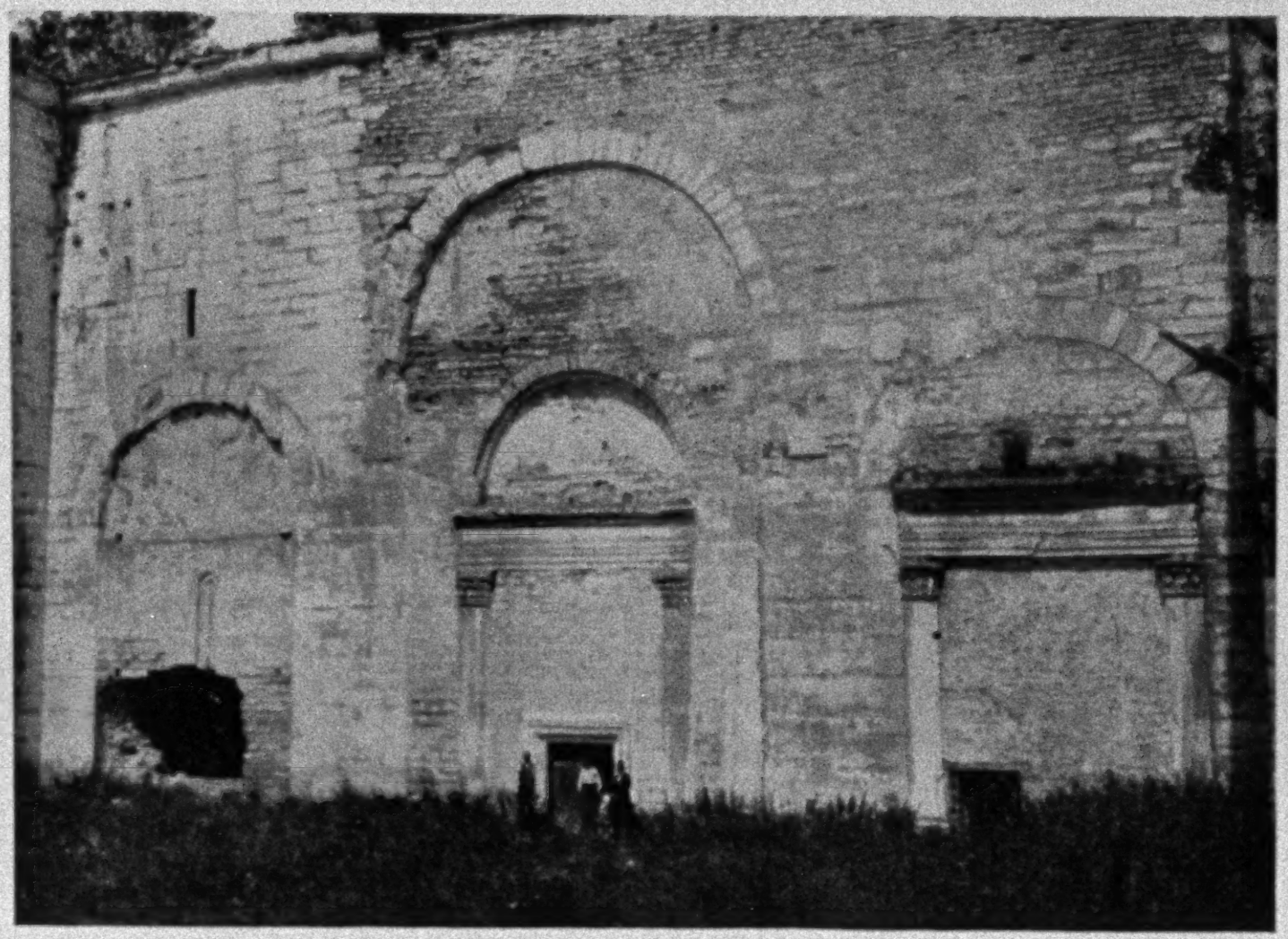


Photo from Edwin A. Grosvenor

THE LONG-FAMED GOLDEN GATE THROUGH WHICH THE TURKS BELIEVE A CHRISTIAN CONQUEROR WILL SOME DAY ENTER CONSTANTINOPLE

This gate was never opened except for triumphal processions. After the capture of Constantinople by Mohammed, in 1453, the gate was closed by special order of the Conqueror. The Turks regard the gate with dread, believing that through it some future Christian conqueror is to take possession of the city.

THE MASTER ARCHITECT

Anthemios of Tralles, the most skillful architect and engineer of the century, the first of the Greeks to utilize the power of steam—"a man," Agathias says, "able to imitate earthquakes and thunderbolts"—was chosen architect-in-chief. With him were associated Isidoros of Miletus and Ignatios the restorer of the Augustæum, architects of almost equal ability and fame.

An angel was considered to have revealed the plan of Sancta Sophia to the Emperor in a dream, not indeed in its entirety and elaborateness of detail, but the one idea, the main conception, which afterward the architects were to develop and clothe with form. This conception was that of a dome, of the greatest possible diameter, made the segment of the largest possible circle, elevated to a dizzy height and sustained by the least possible support. The revelation did not consist in the mere conception of a dome—which was no new idea, though afterward almost monopolized by a single school—but in the most perfect combination of these conditions. Anthemios was to be no mere developer or servile imitator of any system then existent. Byzantine architecture was to spring into its fullest development almost at a bound. Sancta Sophia was "at once the herald and culminator of a new style."

A MARVELOUS CREATION

Proclamations were sent all over the Empire announcing the work Justinian had begun and inviting the coöperation and assistance of the faithful and devout. Patriotism, personal ambition, desire of the Emperor's favor, hope of preferment,

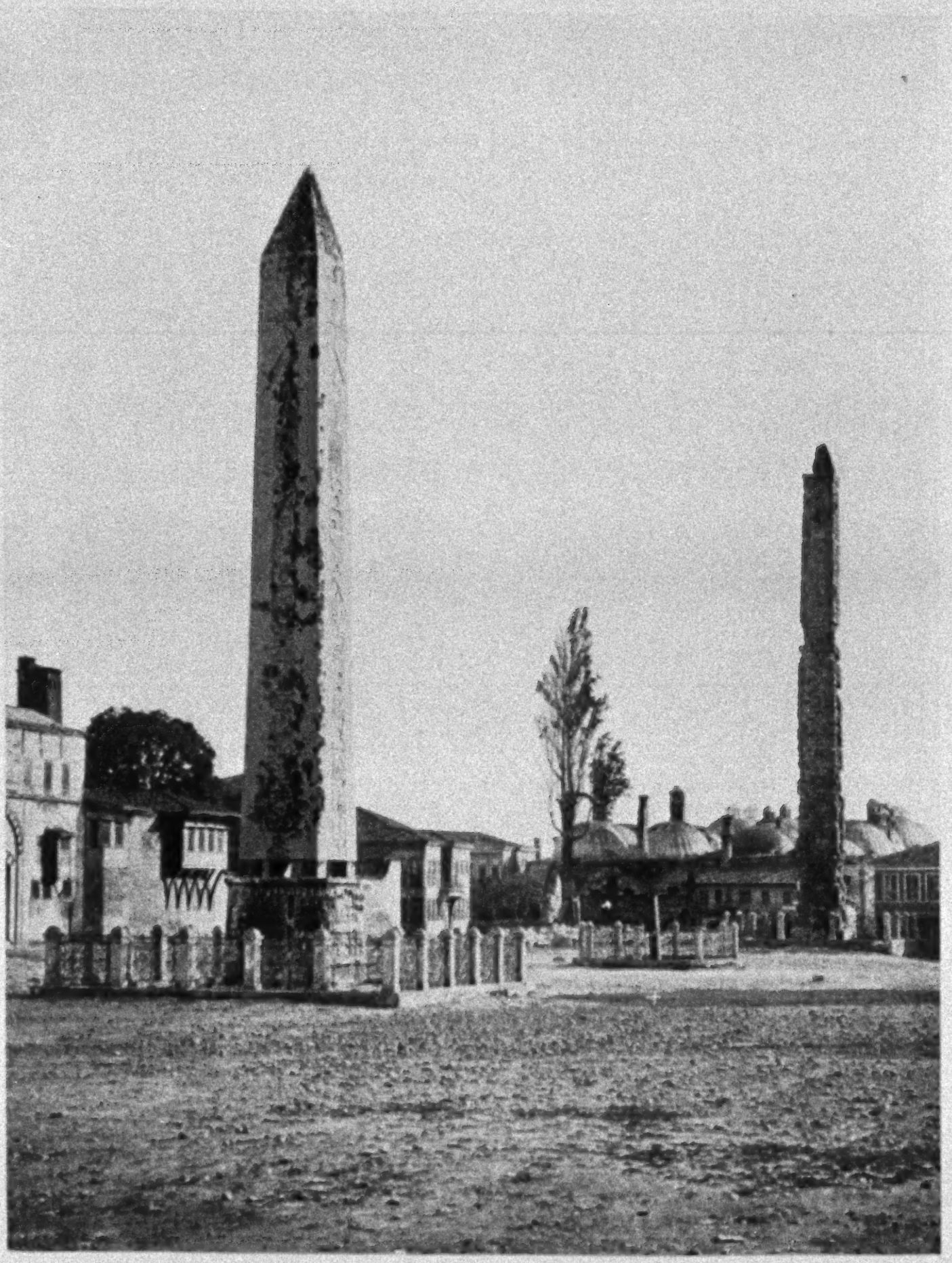
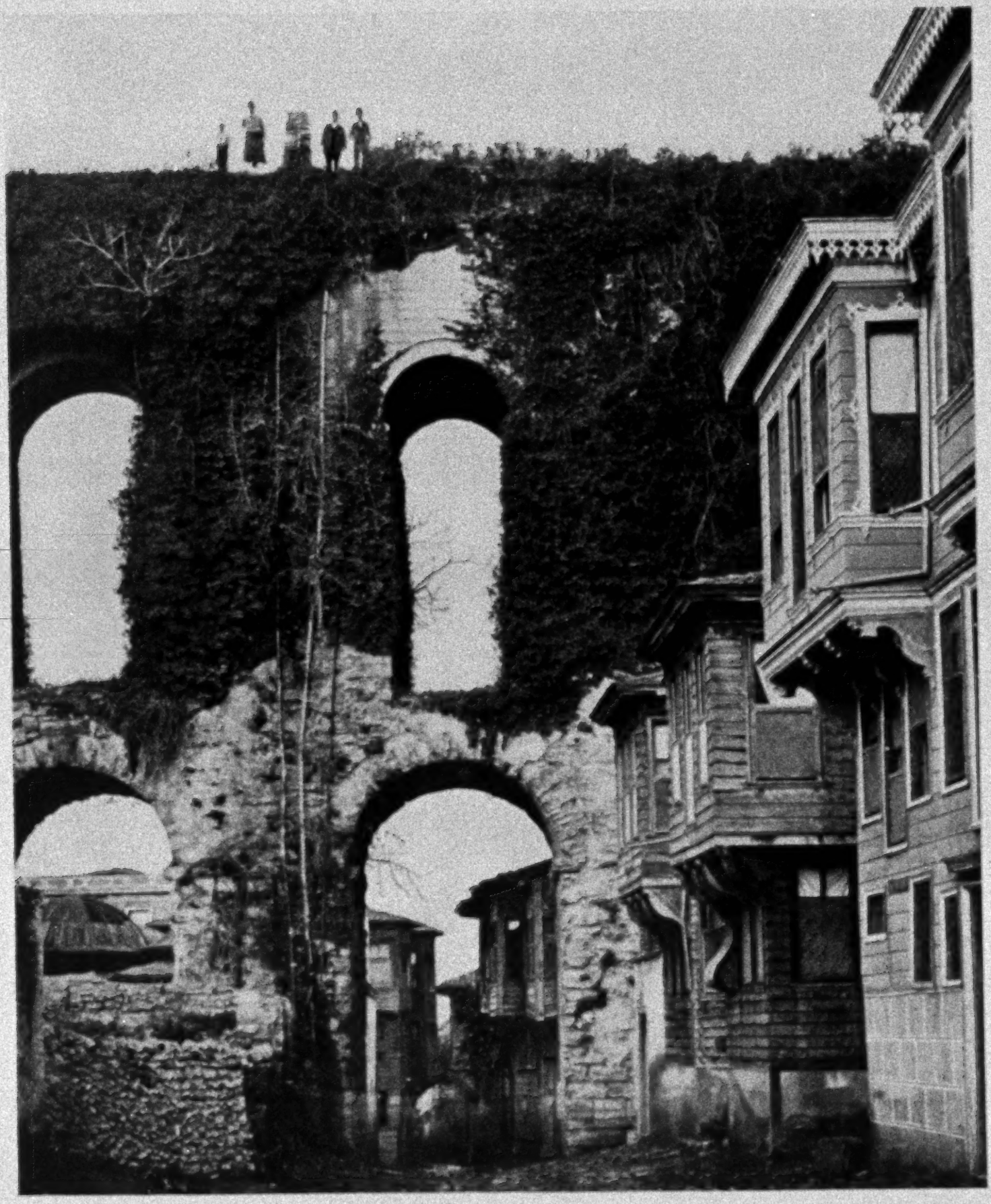


Photo from Edwin A. Grosvenor

TWO OF THE MOST HISTORIC MONUMENTS OF THE WORLD

The obelisk was brought to Constantinople by Constantine, who is nearer in time to us than to the Egyptian king who had it cut out of the quarries of the Upper Nile. It was raised in Constantinople 1,530 years ago, to mark the exact center of the world-renowned Hippodrome, which dwarfed every building throughout the Roman East. Just to the right of the center of the picture, above the +, may be seen the coils of the bronze serpent of Delphi, which was also brought to the city by Constantine the Great. This bronze serpent was erected at Delphi to commemorate the defeat of the Persian hordes at the battle of Platæa, several hundred years before Christ. Upon the coils can still be discerned the names of 19 of the immortal cities which saved Greek civilization from destruction by Xerxes.



THE AQUEDUCT OF VALENS, IN CONSTANTINOPLE

In the erection and various restorations of this stately aqueduct, the greatest among the pagan, Christian, and Moslem sovereigns of Constantinople seem laboring as contemporaries, shoulder to shoulder, though hundreds of years apart. As seen today, it reveals, in its unshaken strength and quaint proportions, the architectural magnificence and childish caprice of Sultan Souleiman I the Sublime. Absorbed in its restoration, he used to pray, the Ottoman historians state, that his life might be prolonged until it was complete. But no sooner was it finished than he ordered its immediate destruction, since it obstructed the view of Shahzadeh Djami, his favorite mosque. Its present abrupt appearance at either end results from the demolition thus begun but not fully accomplished. The hewn stone arches, twenty feet in thickness, are the work of the Byzantine emperors, while those in brick above date from Souleiman. The water it conveyed, considered the purest in the city, was long reserved for the seraglio and now largely supplies the eastern quarters of Stamboul.

everything combined with half-pagan superstition and genuine piety to aid as far as they could. We speak of the Sancta Sophia of Justinian. It is fitting that the great fabric should be peculiarly illustrative of his fame; but it is rather the outcome and creation of a people in its most gilded age. It is rather the burst of a century's enthusiasm than the slow construction of imperial power. In the edifice centered then, as has centered ever since, the whole heart of the Byzantine Empire.

Contributions poured in from Europe, Asia, and Africa, even from remotest provinces. The rich gave of their abundance. More than one poor widow cast in all that she had. Imperial, national, and private treasures were lavished like water, as the work progressed. When earthly resources failed, it was thought that celestial aid was afforded. An angel, disguised as a donkey-boy—a form in which angels are seldom met—was reported to have led a string of mules to secret vaults and to have brought them back with their baskets laden with gold. Justinian, a laborer's tools in his hands, toiled with the workmen. The angelic assistants were as tireless as he. At night, when all were asleep but the watchmen, the walls continued to grow by invisible hands.

MIRACULOUS INTERPOSITIONS

Once, when the men were taking their noonday rest, a man in white raiment suddenly appeared to the boy who watched their tools and told him to hurry the men back to their work. The boy hesitating to leave his post, the stranger said, "I will stay here till you come back." The boy went on his errand, but before he returned the story was told the Emperor. He declared the man in white to be an angel. He gave the boy much money and dispatched him at once to a distant province of the Empire, binding him under most solemn oaths never to return. The humble classes believe that somewhere around Sancta Sophia the outwitted angel is waiting for that boy.

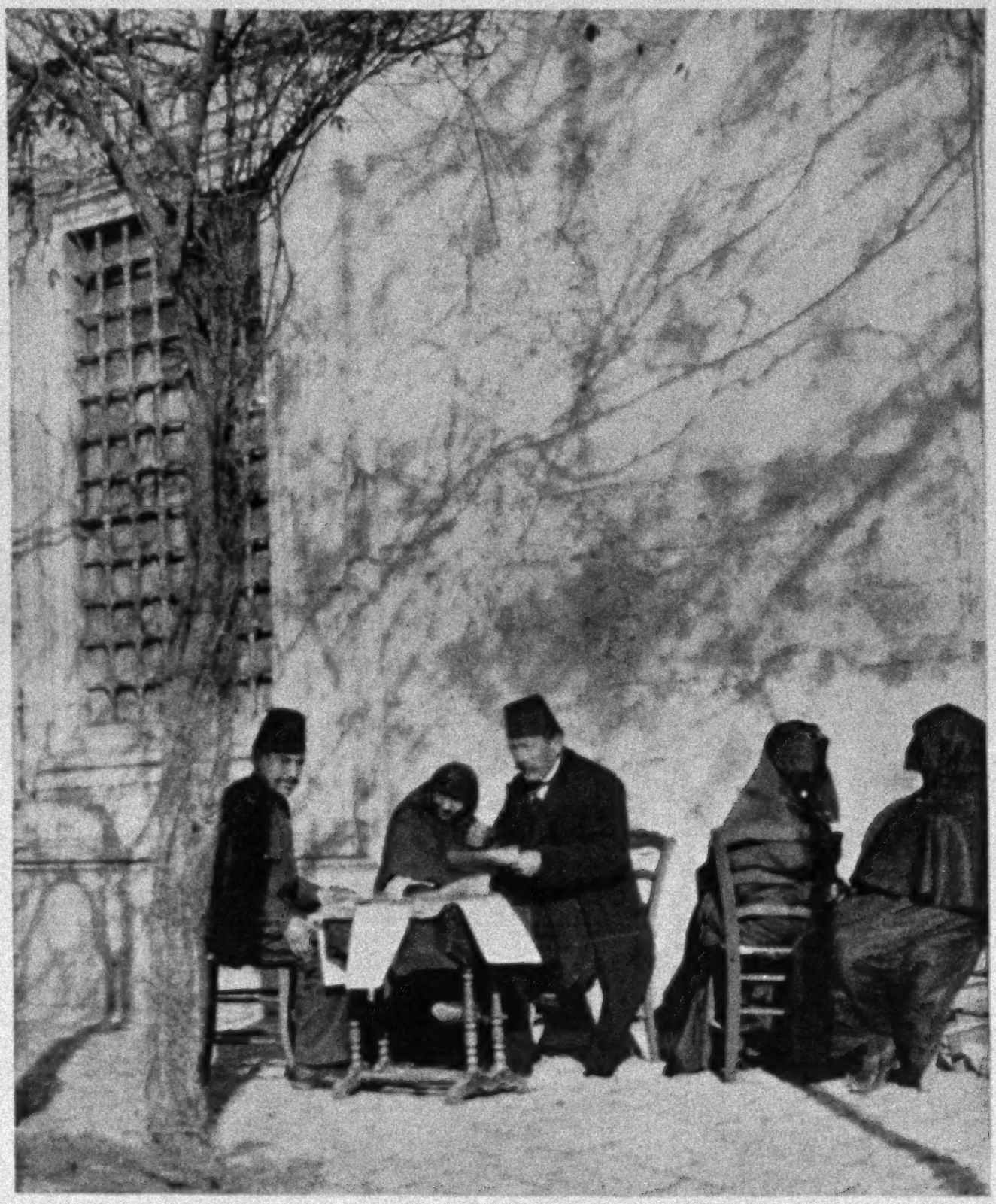
It was believed that celestial music cheered the workmen whenever they grew weary. An auspicious dream never failed the Emperor when in doubt as to some perplexing question of detail; thus when the architects could not agree as to the shape of the apse, an angel in a vision showed the Emperor that it must be triple—its present form—in acknowledgment of the Holy Trinity. The many legends, still affectionately cherished and repeated, "prove," as says Bayet, "how this gigantic enterprise wrought itself into the popular imagination."

"SOLOMON, I HAVE CONQUERED THEE!"

The church was ready for consecration on December 24, 537. The grand procession started from the Church of Saint Anastasia and wound its solemn way by the Hippodrome and the Great Palace, through the Augustæum, to the southern door of the inner narthex. There Justinian removed his crown—never so gladly laid aside as then—and placed it in the hands of the Patriarch Menas. Then alone he passed through the central door, and alone advanced as far as the ambon, or pulpit. From a soul full of the completed magnificence and of bursting gratitude he uttered the exclamation which will be remembered as long as Sancta Sophia endures, and so loud that they who had not crossed the threshold heard his exultant accents—"Glory to God, who has deemed me worthy to accomplish such an undertaking! Solomon, I have conquered thee!" *Σολομὼν νενίκηκά σε.* As he spoke he was standing beside a great mosaic wherein Solomon was represented looking round in speechless, wondering admiration.

That day the entire population of the metropolis feasted as guests of the Emperor. Moreover, 30,000 measures of wheat and several hundredweight of gold were distributed among the poor. On Christmas morning the church was thrown open to public worship. The thanksgiving and rejoicings continued through 14 days.

In the marvelously brief space of less than six years the entire fabric had arisen from its ashes and stood forth majestic and complete. Such rapid achievement would have been impossible had not the pious enthusiasm of the nation equaled that of its Emperor. Saint Peter's at Rome required 120 years for building; Saint Paul's in London, 35 years; Notre



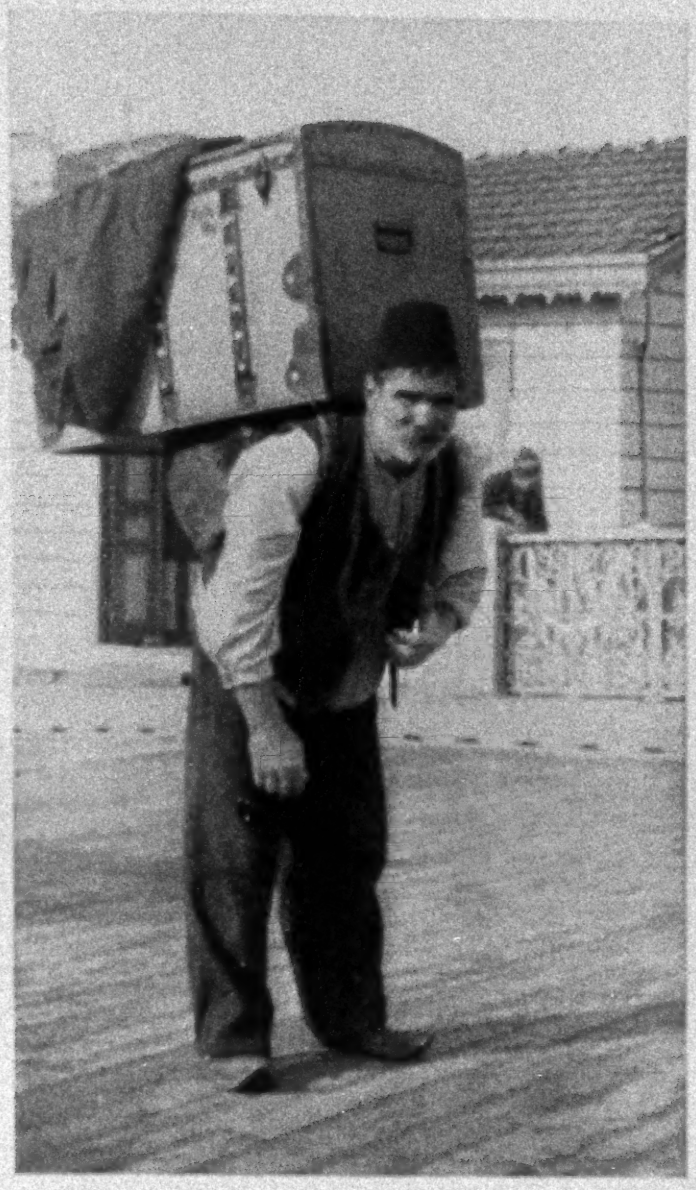
THE LETTER-WRITER IN CONSTANTINOPLE

Most of the Turks cannot write, and are forced to use this means as a substitute for their lack of education. Not only are prosaic or business matters transacted in this way, but also for a small consideration the most tender and impassioned love letters are composed, while the less imaginative lover sits and waits. The ladies, too, have need of his services, and, despite the risk, enjoy the novelty of communicating with those outside of their forbidden haremlik.—Photo and note by MORTIMER J. FOX.

Dame at Paris, 72 years; Milan Cathedral, over 500 years; the Cathedral of Cologne, 615 years; Sancta Sophia, finished centuries before those other venerable Christian temples were begun, not quite six years!

THE MOST COSTLY EDIFICE EVER BUILT BY CHRISTIAN HANDS

The cost must remain very largely a matter of conjecture. Probably the careful and laborious estimate of the Greek historian, Professor Paparrigopoulos, is



THE EXPRESSMAN IN CONSTANTINOPLE

The porters, or hamals, as they are called, have strongly organized unions, entirely in control of the Kurds, a fierce, untamed race, who in their lands in Asia Minor acknowledge no law except that of might. These hamals, with bent backs, proceed at a stolid, animal-like pace, and carry everything from crates of chickens to upright pianos.—Photos and note by Mortimer J. Fox.

near the truth. He reckons the value or cost of ground, material, labor, ornaments, and church utensils at about 324,000,000 Greek drachmas of today, or about $64,000,000. The common estimate of the cost of Saint Peter's is 240,000,000 francs, or less than $48,000,000. It must be remembered that no other Christian church has at all approached Sancta Sophia in the variety and preciousness of its marbles, and, above all, in the prodigal employment of silver, gold, and precious stones in decoration and for the sacred vessels. The expenditure for Sancta Sophia was doubtless greater than for any other sanctuary ever reared by a Christian people to the glory of their God.

It is utterly impossible for us today to picture, even faintly, what that temple must have been as Justinian beheld it. All that the power, the wealth, the art, the skill, and the devotion of the civilized world could create was there; so it might well gleam and stretch away and soar before his enraptured gaze.

Since then numerous buttresses, great and small, high and low, and buildings of every sort have been piled around it, and muffle and disfigure its form. The light of many windows has been obstructed and many others have been closed. Through Mussulman devotion, the mosaic pictures, though preserved, have been covered over, and the crosses and other Christian emblems defaced.

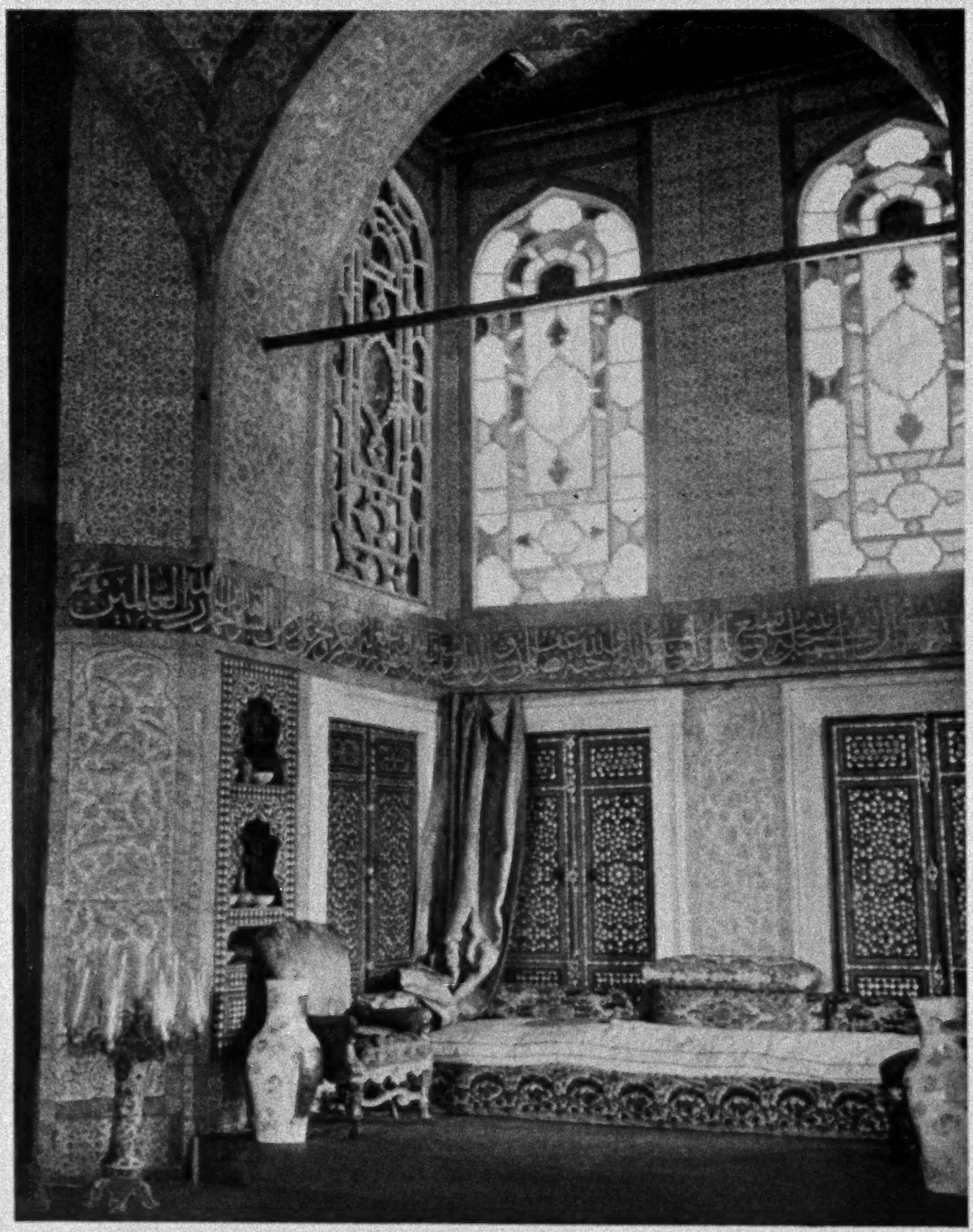


Photo from Edwin A. Grosvenor

THE INTERIOR OF THE KIOSK OF BAGDAD, CONSTANTINOPLE

Photo from Edwin A. Grosvenor

SANCTA SOPHIA: THE MOST COSTLY EDIFICE EVER BUILT BY CHRISTIAN HANDS

"To many Constantinople means nothing but Sancta Sophia. To thousands who have never even heard of the city's wonderful walls, and who have never made a mind-picture of the Bosphorus, the name of its venerable cathedral is a familiar sound. Even to those who know it least it is the synonym of what is grandest, most glorious, most historic, and most sacred in the achievements of Christian architecture" (see page 468).

The countless priceless ornaments of gold and silver have disappeared. The decorations and ecclesiastical furniture added by the Ottomans are incongruous with and mar the whole architectural design of the edifice. Above all must one remember that Sancta Sophia is centuries older than the sanctuaries with which it is commonly compared, and that it has been worn by the feet and dimmed by the dust of countless throngs of worshipers during more than 1,350 years.

THE PERFECTION OF THE DOME

The ethereal dome was and is the unrivaled masterpiece of Sancta Sophia. Forty-five generations of progressive civilization and endeavor have since passed away, but it has never been surpassed or equaled.

The relative degree of architectural perfection among domes may be fairly gauged by the following test: Let fall a perpendicular from the summit of the dome to the plane which passes through its base; make this perpendicular the numerator and make the diameter of the dome the denominator, in the form of a fraction; all other things being equal, the smaller the fraction the more perfect is the dome. The diameter of the dome of Sancta Sophia is 108 feet; its perpendicular, the distance from its apex to its base, is 46 feet; hence 46/108, or about 6/14, will represent its fraction. The diameter of the dome of Saint Peter's is 139 feet, but its perpendicular is 190 feet; its fraction, therefore, is 190/139, or about 19/14. The diameter of the dome of the Pantheon, now Santa Maria Rotonda, is 143½ feet, but its perpendicular is the same; hence its fraction is 14/14. So the relative fractions are: Saint Peter's, 19/14; the Pantheon, 14/14; Sancta Sophia's, 6/14.

These details are absolutely necessary to a comprehension of that which constitutes the peerless distinction of Sancta Sophia. Those two wider domes, stupendous masterpieces as they are, are eclipsed in beauty as well as daring by that sky-mocking vault which Anthemios threw into the air 1,360 years ago. In Saint Peter's at Rome the dome is complement of the building and not its major design. There the dome exists for the sake of the building and not the building for the dome. In Sancta Sophia this is all reversed. Here the dome is the end, and the structure on which it rests is but the means to uphold it and lift it near the sky.

The historical importance of Sancta Sophia is almost boundless. No other church in any land, no other structure reared in any age by human genius, has held so large a place in a nation's life. "In its name is centered the entire duration of Byzantine history." The Cathedral of Rheims, Notre Dame, Westminster Abbey, Saint Peter's, the Parthenon, tenanted and crowded as they are by thrilling associations, evoke not so countless memories. This is the official sanctuary of an empire wherein church and state were one and which through more than 1,100 years was the heir and equal of Rome.

RUSSIA'S DEBT TO SANCTA SOPHIA

There, beside the Ephesian column, stood, in 987, the pagan envoys of the Russian Vladimir, who had been sent over the world "in search of the true religion." The resplendent majesty of the temple, the venerable files of priests in gorgeous sacerdotal robes, the celestial chanting of the choir, the mounting clouds of incense, the reverent hush of bending thousands—all the mystery of an unknown and sense-subduing ritual bore captive the untutored minds of those rustic children of the North. As their historian Karamsin declares: "This temple seemed to them the abode of Almighty God himself, where he manifested his glory direct to mortal eyes."

So the envoys went back to their Slavonian prince and told their story in the following words: "We knew not if we were not already in heaven. Verily, on earth one could never find such riches and such magnificence. We can only believe that one was surely in the presence of God, and that the worship of all other countries is thereby far surpassed." Vladimir accepted the narration and the faith of his envoys. He was baptized as the spiritual son of the emperors Basil II and Constantine IX, and was soon close bound to them by bonds of mar-

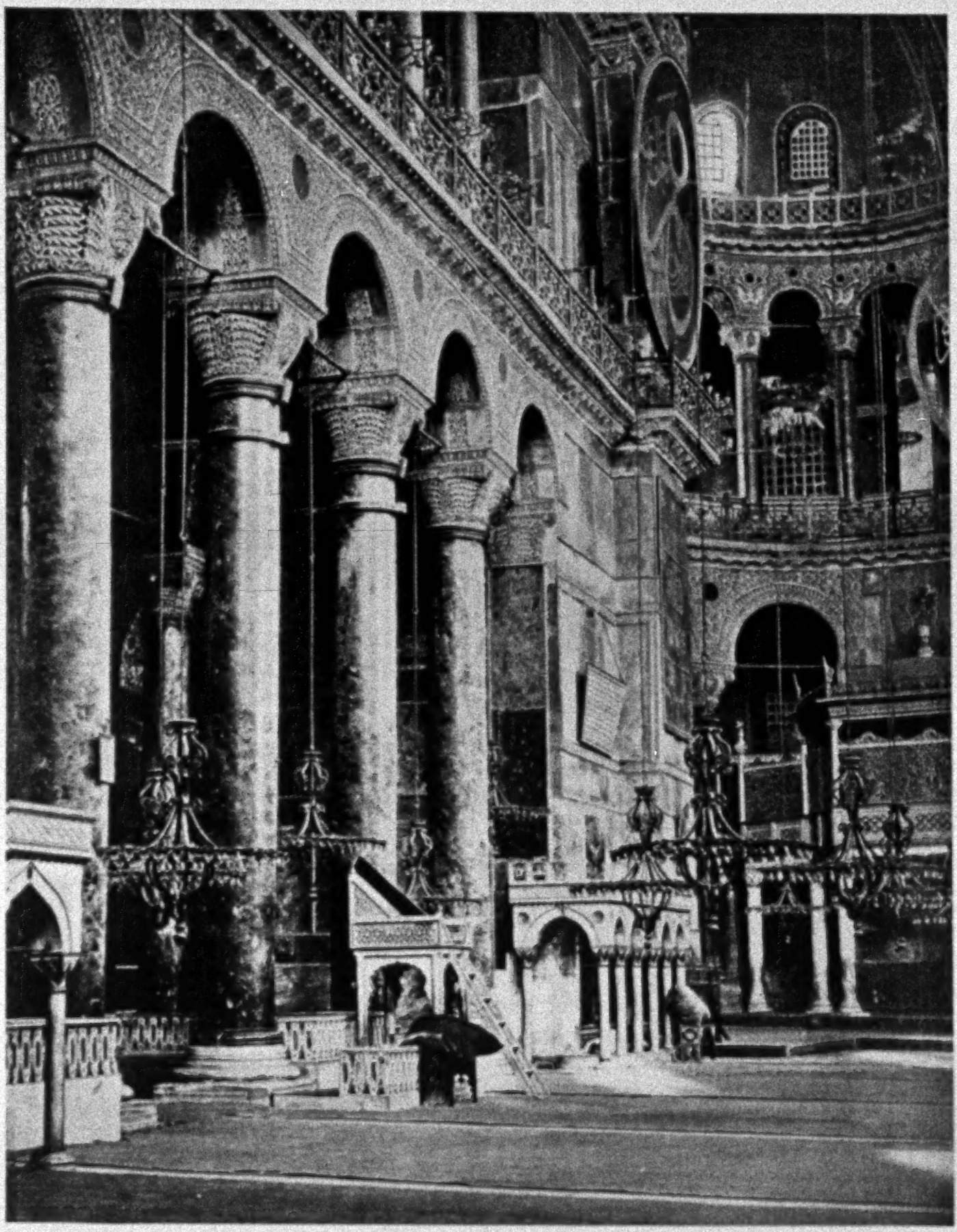


Photo from Edwin A. Grosvenor

FOUR OF THE EIGHT SPLENDID SERPENTINE COLUMNS IN SANCTA SOPHIA BROUGHT FROM DIANA'S EPHESIAN TEMPLE

There are 107 columns in Sancta Sophia which were gathered from the most famous temples of the classic world. "Despite all their efforts to transform Sancta Sophia, its Christian characteristics can be effaced only by its own destruction. Its structural form has always resisted the requirements of the Moslem ritual. It resembles a mighty captive, ever mutely protesting against his chains" (see page 482).

riage as the wedded husband of their sister, the Princess Anna.

Vladimir and the Russians ever since, grateful that from Constantinople they had received the boon of their holy faith, clung to the great Mother Church and their Christian coreligionists with filial and fraternal fidelity. Beneath the scepter of the Czar the worship is the same today as that which carried captive the envoys in Sancta Sophia.

On July 16, 1054, while the church was thronged by the Orthodox clergy and people, Cardinal Humbert and two other Latin bishops, legates of the Pope, walked steadily up the nave till they reached the altar in the holy place. Then, standing under the colossal mosaic picture of the meek-eyed Christ, whose arms were stretched in blessing, they laid upon the altar the papal excommunication of the Orthodox Eastern Church and the anathema against the seven deadly heresies of the Greeks, devoting them and all who shared their doctrines "to the eternal society of the devil and his angels." Then "they strode out, shaking the dust from their feet and crying, 'Let God see and judge.'"

Thus the seamless robe was rent; the hitherto undivided Christian Church was torn in twain and has never since been reunited. The Protestant may ill determine or appreciate the rights and wrongs of the contending parties, of Michael Keroularios the Patriarch, or of Leo IX the Pope; the points at issue, so vast to them, may appear trivial and of almost microscopic littleness today. But it may be doubted if any act more disastrous to Europe, and above all to Eastern Christianity, was ever performed than this on which the silent walls of Sancta Sophia looked down. Well may Mathas, Bishop of Thera, exclaim: "Unutterably frightful have been the consequences of this schism."

Here, on Easter morning, in April, 1204, the warriors of the Fourth Crusade, red-handed from their conquest of the city, caroused and feasted. A courtesan, seated on the patriarchal throne, sang obscene songs in nasal tones to mock the chanting of the Greeks. Meanwhile the drunken soldiers indulged in nameless orgies with women of the street, and the fane resounded with their indecent and satanic glee. In derision the consecrated bread and wine were mixed with blood and dung. Meanwhile strings of beasts of burden were driven in, covered with priestly robes and loaded with plunder. The shocked and sorrowing Pope Innocent III reproached the Crusaders with bitter words and declared that "the Greek Church would see in the Latins only treason and works of darkness and loathe them like dogs." The undying memory of those deeds lingers among the Greek inhabitants of Constantinople to this day. So it is not strange that, when the death-throes of the Byzantine Empire had begun, many a fanatic Greek looked with equal aversion upon a doctrine or a soldier from the West.

SORROWS OF THE BRIDE OF COUNT BALDWIN

On May 26, 1204, Baldwin, Count of Flanders and Hainault, having been tossed in Teutonic fashion upon the shield, was crowned in Sancta Sophia first Latin Emperor of the East. Twelve months afterward the cathedral afforded a splendid sepulcher to the remains of Dandolo, the Doge of Venice, the real brain of the Fourth Crusade. It was he who prostituted its piety to mere material advantage and drowned remembrance of its earlier, loftier aim—recovery of the Holy Tomb and the Holy Land—in the conquest and sack of a Christian capital. Though dying at the age of 97, his physical and mental powers continued unabated to the last.

A few months later the cathedral doors swung open, as the portal of a mighty tomb, to receive a gentler and more appealing tenant. Mary, the bride of Baldwin, had remained at home when her just-wedded husband departed on his wars. Romantic and loving, she had besought in vain that she might go with him and share his dangers. Afterward she had embarked for Constantinople that she might share his throne. Her ship, driven from its course, was wrecked in Palestine. Only after weary wanderings and fearful experiences did she reach the capital.

No husband was there to greet the worn-out wife. Baldwin, made prisoner

in battle by Joannice, King of the Bulgarians, had been put to death, and his skull, lined with gold, was serving as a drinking-cup to his savage conqueror. Hopeless and broken-hearted, nothing was left the wanderer save to sicken and die. The pathos of her story redeems some of the coarser horrors of the Fourth Crusade, and makes it meet that she should rest at last within that most regal pile where she had dreamed of being crowned by her husband's hands.

CONSTANTINE'S LAST COMMUNION

There is nothing more pathetic in the long, troubled annals of the Eastern Empire than the night before its glorious fall. On May 28, 1453, an hour before midnight, Constantine came once more to Sancta Sophia. The sacrament was administered, but by Romish hands, to him and to his immortal band, as to the dying. He knew, and so did each in that silent company, that if they were faithful unto death the sands of their earthly life had less than 24 hours to run. No hope of victory then flickered in that solemn scene. No less grand was it than Leonidas and the Spartans at Thermopylæ. All equal in that crucial hour, the Emperor, that he might be absolved by all, begged the forgiveness of any whom in his brief reign he might have unwittingly wronged. The mail-clad men were not ashamed to weep, and their answering sobs alone broke the stillness. Then the last Byzantine emperor crossed the threshold that for centuries no Christian sovereign was to tread.

On the following day Sancta Sophia was packed with a throng such as it had never seen before. Not that the concourse was more vast, but a common agony filled the souls of all. Some were indeed clinging to the ancient legend that when a victorious enemy reached the Column of Constantine an angel would place a flaming sword in the hand of a little child, who forthwith would drive back the invaders. The Ottomans beat open the doors of the southern vestibule, whereon may still be seen the marks of their impatient violence. The crowded mob of refugees, paralyzed with horror, offered no resistance. No blood was shed, either of conquered or conqueror. No violence was used. The half-dead captives—ascetic monk and maiden on whose veiled face the sun had hardly shone, high-born lady and kitchen scullion, patrician and beggar—were bound together in couples and driven forth in long files to be sold as slaves.

THE OTTOMANS' DEVOTION

The Ottomans regard Sancta Sophia with the utmost reverence. Therein they but follow the example of the illustrious Conqueror, whose eager steps first turned hither after his hard-won victory and whose first official act in his blood-bought capital was its conversion into a mosque. Alone of all churches submitted to Islam, it retains its Christian name, the Aya Sofia of the Moslems being but the literal rendering of the Ἁγία Σοφία of the Greeks.

Despite all their efforts to transform Sancta Sophia, its Christian characteristics can be effaced only by its own destruction. Its structural form has always resisted the requirements of the Moslem ritual. It resembles a mighty captive, ever mutely protesting against his chains. The long rows of prayer carpets stretch in diagonal lines, inharmonious, across the floor, and the devotees, facing Mecca, are forced to bend in an unnatural direction toward the corner of the church.

CHRIST'S IMAGE STILL REMAINS

In the prostituted church the Christian, weary of Arabic inscriptions and Ottoman traditions, grows heart-sick and hungry for something that is his. The ever-present architectural grandeur and invisible memories of the past are not enough. Let him ascend the southern gallery and gaze from among the six colonnaded columns toward the vaulted ceiling above the five windows of the central apse. Gradually in the dim, half-veiled surface he discerns the mosaic form of a colossal Christ. The hair, the forehead, the mild eyes of the Saviour may be traced and the indistinct outline of his form. The right hand, gentle

> "as when
> In love and in meekness he moved among men,"

is extended still in unutterable blessing, and in its comprehensive reach seems to embrace the stranger. Within the shadow one feels Christ is keeping watch above his own.

WILD COLUMBINE
(*Aquilegia canadensis* L.)

BROAD-LEAVED ARROW-HEAD
(*Sagittaria latifolia* Willd.)

VIRGINIA COWSLIP OR BLUEBELL
(*Mertensia virginica* (L.) DC.)

HEDGE OR GREAT BINDWEED
(*Convolvulus sepium* L.)

LARGER BLUE FLAG
(*Iris versicolor* L.)

WILD PINK
(*Silene caroliniana* Walt.)

COMMON EVENING PRIMROSE
(*Oenothera biennis* L.)

STAR GRASS
(*Hypoxis hirsuta* (L.) Coville)

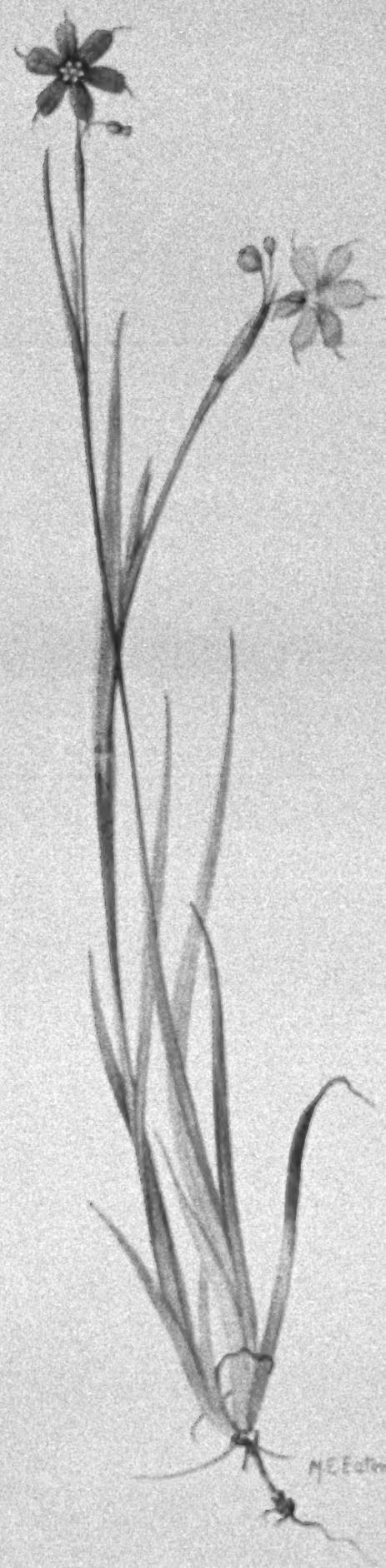
WILD GERANIUM OR CRANE'S-BILL.
(*Geranium maculatum* L.)

COMMON DAYFLOWER
(*Commelina communis* L.)

BLACK-EYED SUSAN
(*Rudbeckia hirta* L.)

JEWEL-WEED
TOUCH-ME-NOT
(*Impatiens pallida* Nutt.)

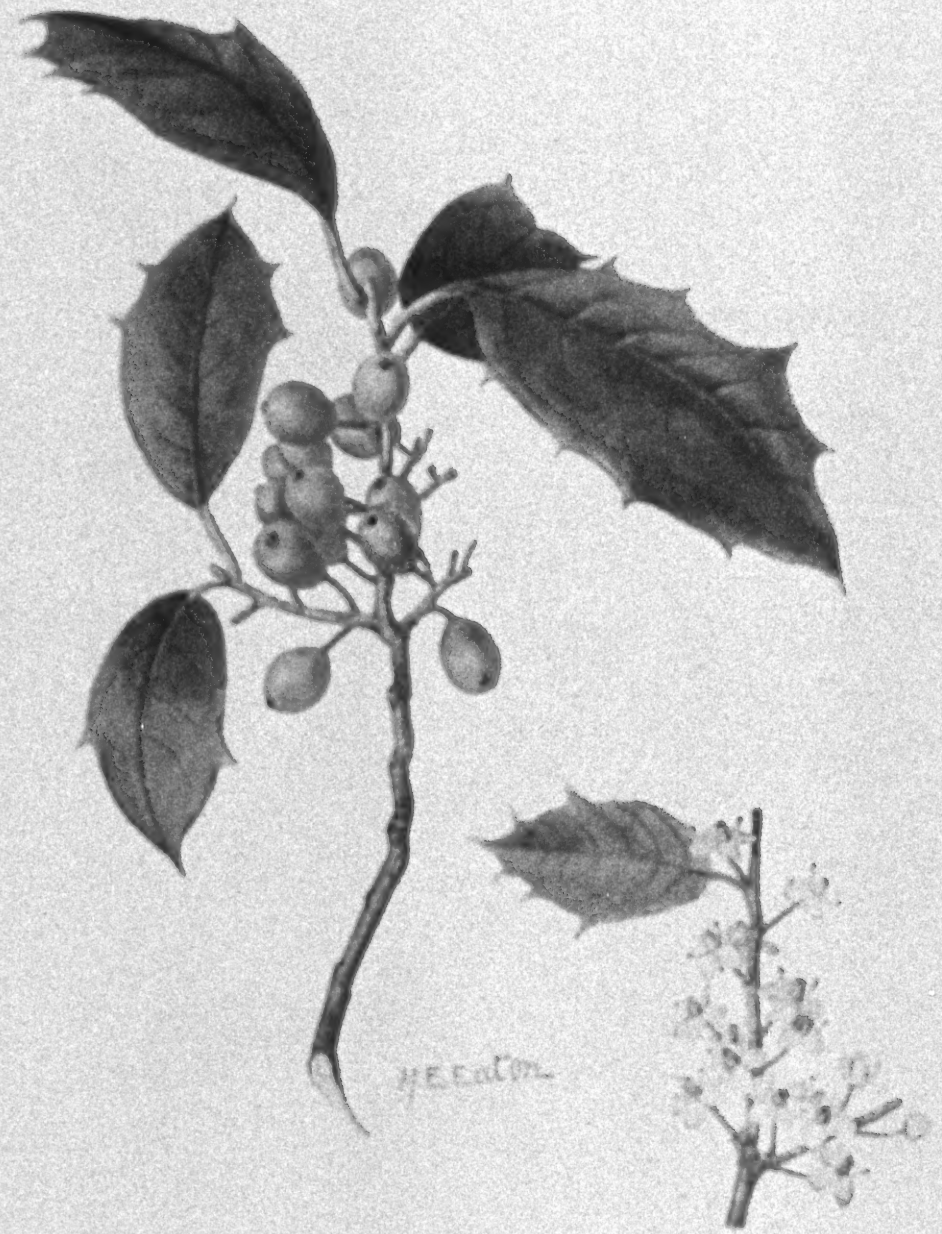
Bulb-bearing Loosestrife
(*Lysimachia terrestris* (L.) B. S. P.)



Eastern Blue-eyed Grass
(*Sisyrinchium graminoides* Bicknell)

CARDINAL FLOWER
RED LOBELIA
(*Lobelia cardinalis* L.)

SWAMP OR MARSH BUTTERCUP
(*Ranunculus septentrionalis* POIR.)



American Holly
(*Ilex opaca* Ait.)

Virginia or Scarlet Strawberry
(*Fragaria virginiana Duchesné*)

WILD YELLOW LILY
CANADA LILY
(*Lilium canadense* L.)

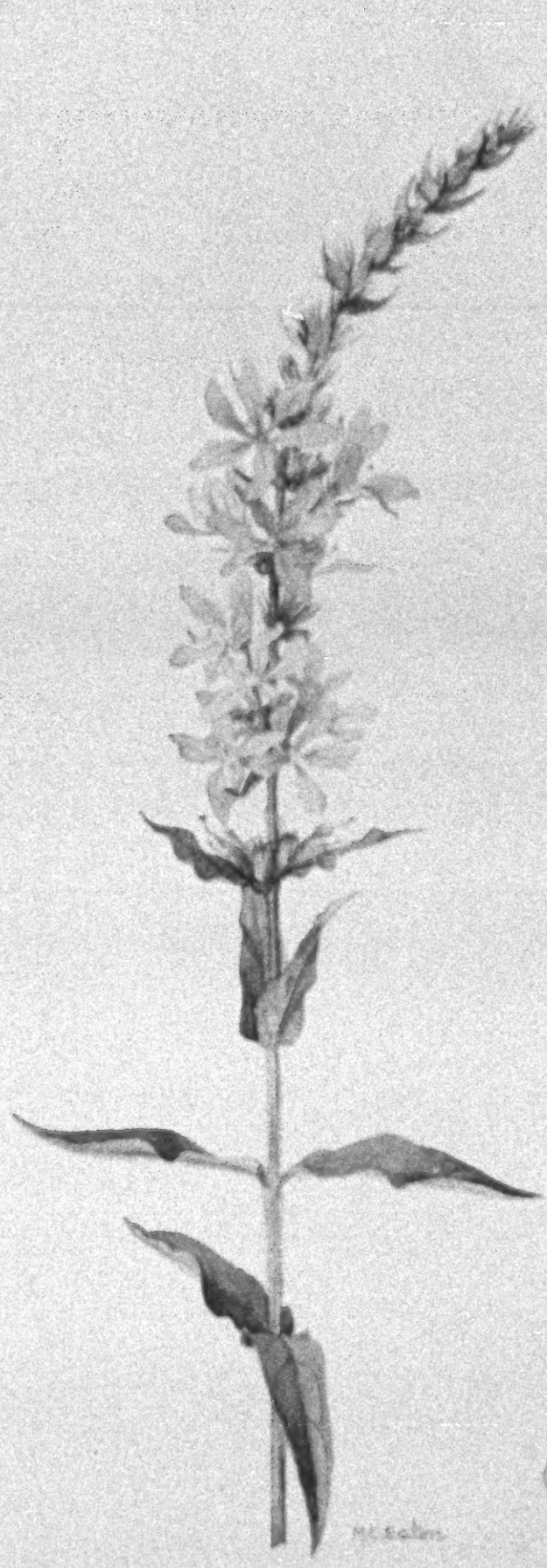
TURK'S CAP LILY
(*Lilium superbum* L.)

WITCH HAZEL
(*Hamamelis virginiana* L.)

WOODY NIGHTSHADE
BITTERSWEET
(*Solanum Dulcamara* L.)

PURPLE FLOWERING RASPBERRY
(*Rubus odoratus* L.)

BLACK HAW OR STAG BUSH
(*Viburnum prunifolium* L.)



PURPLE LOOSESTRIFE
(*Lythrum Salicaria* L.)

MOTH MULLEN
(*Verbascum Blattaria* L.)

SHOWY LADY'S-SLIPPER
(*Cypripedium reginæ* Walt.)

TWIN BERRY
PARTRIDGE BERRY
(*Mitchella repens* L.)

MAYFLOWER
TRAILING ARBUTUS
(*Epigæa repens* L.)

AMERICAN WILD FLOWERS

In this number, pages 483–506, the GEOGRAPHIC MAGAZINE *prints its first color series of American wild flowers. In future numbers other wild flowers will be pictured in colors, as it is planned gradually to give the members of the National Geographic Society in their Magazine as complete a collection of common wild flowers of all parts of the United States as has been given of the common birds of town and country. There are many hundreds of wild flowers, many more than there are varieties of birds. The present collection contains flowers blossoming from late spring to September. The pictures were made by Miss Mary E. Eaton, and will undoubtedly be admired by every reader for their delicacy and beauty.*

In the descriptions accompanying these splendid pictures the spirit in which they were written is that of one of our great botanists, who says:

"Let us content ourselves no longer with being mere 'botanists'—historians of structural facts. The flowers are not mere comely or curious vegetable creations, with colors, odors, petals, stamens, and innumerable technical attributes. The wonted insight alike of scientist, philosopher, theologian, and dreamer is now repudiated in the new revelation. Beauty is not 'its own excuse for being,' nor was fragrance ever 'wasted on the desert air.' The seer has at last heard and interpreted the voice in the wilderness. The flower is no longer a simple passive victim in the busy bee's sweet pillage, but rather a conscious being, with hopes, aspirations, and companionships. The insect is its counterpart. Its fragrance is but a perfumed whisper of welcome, its color is as the wooing blush and rosy lip, its portals are decked for his coming, and its sweet hospitalities humored to his tarrying, and, as it speeds its parting affinity, rests content that its life's consummation has been fulfilled."

This wonderful collection in colors has cost many thousands of dollars to reproduce, but the GEOGRAPHIC *believes that the beauty of the subjects and the importance of encouraging the study and preservation of American wild flowers more than justify this expense.*

THE WILD COLUMBINE (Aquilegia canadensis L.)

(See page 483)

Among all the flowers that bloom, none outshine the wild columbine for wild grace, untrammeled and unconventional beauty, or the idyllic nature of its habitat.

Choosing the stony ground of the inner woodlands for its favorite abiding place, enjoying a long flowering season, covering the April-July period, and cosmopolitan enough to be at home from Nova Scotia to the Northwest Territory and from Florida to the Rocky Mountains, it is one of the most pleasant of our summer visitors.

This striking flower is a child of America; it is said that during the reign of Charles I a young colonist kinsman of the king's gardener sent to him from Virginia specimens of the plant for the adornment of the gardens of Hampton Court.

Like most flowers, the columbine has made remarkable provision for its own propagation. Its nectar it hides far back in its little cornucopias, where only those insects who are able to carry its pollen to some other flower can partake of its sweets.

So the nectar of the columbine is largely reserved for the big bumblebee and the little humming-bird. The former with his long tongue and strong legs can hang upside down as gaily as an acrobat on a trapeze and drink its nectar while doing so. And the ruby-throated humming-bird finds the inverted position of the honey-cup no disadvantage.

The efforts of the flowers of the field to dress in the colors that delight the senses of the creatures that bear their pollen is strikingly shown in the columbine. In Europe the ruby-throated humming-bird is a stranger, and the columbine wears colors vanishing from red to blue, for the bee is its pollenizing agent there, and, as Sir John Lubbock proved by a striking series of experiments, the favorite color of the bee is blue. On the other hand, in America, where the humming-bird is the principal fertilizing agent, the columbine attires itself in a dainty red that is known to delight "king ruby-throat."

Some of the smaller bees have learned of the discrimination that the columbine practices against them through its length and narrowness of neck, and frequently they may be seen ripping holes in the tips of the petals and getting the nectar without paying their toll of pollen-carrying to the flower. As a defensive measure against this rape of her sweets, the

columbine secretes a bitter juice that often foils the invaders.

Dr. Prior declares that the columbine got its name because of the resemblance of its nectaries to the heads of pigeons in a ring around a dish—a favorite device of ancient artists.

BROAD-LEAVED ARROW-HEAD (Sagittaria latifolia Willd.)

(See page 484)

Loving shallow water and muddy soils, the broad-leaved arrow-head is still equally at home on the banks of the Rio Grande and on the shores of Hudson Bay. Its flowering season is from July to September.

No flower of the field or forest can survive long unless it learns to adjust itself to its environment. It is only the cultivated plant that cannot do this. Years of reliance upon man to fight its battles for it have taken from the cultivated plant all ability to fight its own battle of existence. Who ever heard of lettuce being able to flourish outside of the garden? Or the bean? Or the beet? Or the cabbage? Their resourcefulness has been bred out of them and they must have their homes prepared for them.

Not so with weed and wild flower. With no hand to help them, they fight their battle for the survival of the fittest with their own generalship and their own forces. How strikingly is this illustrated by the arrow-head! Loving the water, it must be in a position to maintain itself when the freshet of June comes and submerges it, and again when the drought of August steals the last vestige of water from its pool.

So it is able to breathe under water like a fish and out of the water like a dry-land creature. When it is under water, there are narrow, ribbon-like leaves which give a maximum of surface exposure to the water, and yet a minimum of resistance; but when it grows on dry ground the ribbon-like leaves fall off, and the big, broad arrow-head leaves that give the plant its name assimilate the carbonic acid gas, give off oxygen, and ward off an oversupply of sunshine.

THE VIRGINIA COWSLIP OR BLUEBELL (Mertensia virginica (L.) DC.)

(See page 485)

When Harry Lauder sings about the lassie he loves who is as modest as her namesake, the bluebell, he accords her high praise, for the English bluebell is not fairer or more modest than its American namesake, and who has not noted the simple, drooping modesty of this fair little inhabitant of the meadows of eastern America!

In April and early May it comes out to cheer the waiting world, a little behind the arbutus, the crocus, and the daffodil. It loves the alluvial low ground of the meadow land and ranges from southern Canada to South Carolina and Kansas. Its flowers stay with us until late May.

No lover of the beautiful has ever failed to pay tribute to the bluebell. Its drooping porcelain-blue bells have won praise from the naturalists of the world. An English writer pays high tribute to them, saying that no flower surpasses the bluebell family in beauty of form and foliage or in the graceful way in which they rise to panicles of blue. The fairest of them he rates the Virginia cowslip.

Every insect that loves nectar can drink at the bluebell's bar, for "broad is the gate and wide is the way, and many there be that go in thereat." But every insect that comes must be a pollen-bearer, for the bluebell needs must have cross-fertilization.

One of the unexplained idiosyncrasies of the bumblebees occurs in conjunction with their feasts out of the bluebell's honey well. Only the female bumblebee is flying when the bluebell blooms, and they are able to sip far deeper cups than the bluebell can offer; but, whether from laziness or mischief or what, they may frequently be seen trying to dodge their duties as pollen-bearers by perforating the cups instead of draining them in a legitimate manner.

HEDGE OR GREAT BINDWEED (Convolvulus sepium L.)

(See page 486)

A hobo among flowers is the bindweed. It has traveled up and down the lanes of world-trade for centuries, until it has come to claim most of the northern hemisphere for its abiding place. It is one of America's most bothersome weeds, as any farmer's son can bear witness who has operated a harrow or a grain drill when preparing corn ground for wheat sowing in the fall.

It loves wayside hedges and thickets, where it climbs over everything in its fight for the survival of the fittest; but it simply rejoices when it gets into a corn-field and can utilize the tall stalks of corn as a nature-built trellis for it. In our own country it has found the Rocky Mountains a barrier, and for the time being has had its star of empire arrested here, on its broad sweep around the northern world.

The flowering season of the great bindweed is the June-September period. A close relative of the fair morning-glory, its flowers are shaped like those of that charming summer visitor and behave something like them. It is a rather early riser, and lives out the doctrine that "early to bed and early to rise" produces health, wealth, and wisdom; for it goes to bed when the sun goes down, except on moonlight nights, when it keeps open house for the benefit of certain moths that are its especial friends.

A curious thing about the great bindweed is the fact that it cannot maintain itself, hardy and self-reliant as it is, where its special insect friends do not dwell. In Europe a certain moth flourishes in some districts, is rare in others, and entirely absent in still others. Wherever the moth is numerous the bindweed

is everywhere; where it is scarce the bindweed is an occasional visitor only; but where it does not dwell at all the bindweed never comes. Without the aid of that moth it is unable to set seed and therefore unable to propagate itself.

The bindweed is an exceedingly rapid climber. The twining stems often describe a complete circle in less than two hours, turning always in the direction opposite to that of the hands on the face of a watch. A transverse section of the flower of the bindweed, cut so as to show the passages leading into the nectar chamber, makes it look like the cylinder of a "five-shooter" revolver.

Not only is the great bindweed a relative of the morning-glory, but it is close of kin to the plant from which the "jalap" of the chemical world comes. It itself has some of the therapeutic properties of jalap, and it is said that hogs, which eat almost everything except tomatoes, give it a wide berth.

LARGER BLUE FLAG (Iris versicolor L.)

(See page 487)

Among the stateliest and proudest of the members of America's flower family none excels the larger blue flag, which also wears the names of blue iris and fleur-de-lis. Ruskin calls it the flower of chivalry, which has a sword for its leaf and a lily for its heart. Longfellow pronounces it "a flower born in the purple, to joy and pleasance."

The larger blue flag seeks the wet, rich marsh and meadow, where it can find ample moisture for its rich nectar manufactories. It flowers from May to July, and lends its beauties to America from Newfoundland and Manitoba to Florida and Arkansas.

From the standpoint of the botanist, the larger blue flag has an especial interest because of the remarkable care it has taken to evolve a never-failing system of cross-fertilization and to avoid self-fertilization. The position of the stamens is such that it is next to impossible for their pollen to reach the stigmas of the same flower, for these stigmas are protected from the stamens by being borne in pockets on the inner surface of the petal-like, overarching styles.

Therefore the flag flower must look to the insect world entirely for its propagation, and to the bees in particular. So it puts forth a flower that is blue tinted, for its experience has taught it that a bee can be wooed with blue better than with any other color. Dressed in her beautiful gown of blue, the pretty flower maid proves irresistible to the passing bee, who turns aside to drink at her well, and is given her message of life to bear to some other waiting flower. The bee finds the recurving platform of the handsome sepal an ideal landing platform, and from this the dark veins and golden lines form the guide-posts that point with unerring aim toward the nectar cup below.

The iris was long centuries ago adopted by Louis VII, the gallant young Crusader, as the emblem of his house. It became thereby "the flower of Louis," which was corrupted into "fleur-de-lis."

The iris, or blue flag, is really meant when one speaks of the lily of France. The story runs that King Clovis, beaten on the battle-field as long as he had three black toads upon his shield, finally adopted the iris instead, upon the plea of Queen Clotilde, to whom it had been related by a holy hermit that an angel had brought him a shield containing three irises and shining as the sun. Clovis thereafter was successful on the battle-field. In later reigns the iris was thickly strewn upon the royal standards of France, but Charles V finally reduced them to three to typify the Holy Trinity.

The iris is a plant that insures its life. It has a big rootstock, which contains a powerful hepatic stimulant known as "iridin." In this rootstock it stores up endowment insurance in the days of plenty, so that when the earth is chill, cold, and inhospitable its savings will provide against need.

WILD PINK (Silene caroliniana Walt.)

(See page 488)

An attractive little flower is the wild pink, or catchfly, which seeks the dry, gravelly or sandy soil as persistently as the larger blue flag or the broad-leaved arrow-head seeks the soft alluvial or marshy ground. From April to June its delicate pink petals give cheer to many a lonesome place, and it has succeeded in claiming a rather large area for its occupancy, extending from New England to Georgia and Kentucky.

As fresh as the springtime itself are these little flowers, when they open up to join the floral chorus that proclaims that spring has come to stay. They are flowers which never believe in taking chances, when it comes to the question of fertilization, so they have developed two sets of stamens, five to each set. The one set rises first, then the other, so that if one misses the transfer of its pollen the other is likely to supply the resulting deficiency. After all their pollen is shed, three recurved styles put in their appearance out of the depths of the tube, ready to receive pollen brought by the bees and butterflies from other flowers.

The wild pink finds its cupboard of sweets a fair mark for many tiny insects that are large enough to drain its cup of nectar and yet too small to bear away the flower's pollen to some distant mate. So it has provided an effective lock and key to that cupboard, which makes it proof against the pilferer. This lock and key is a gummy, viscid fluid that the pink secretes and spreads around the sticky stem below the flower. And woe betide the creeping thing that is a thief and a robber from the pink's standpoint! For no fly that ever alighted on a piece of man-made fly-paper was more certainly and surely brought to an untimely end than the ant that essays to sip the nectar of a wild pink. Thus we can see that the fly-paper idea is not man's invention at all, but an idea borrowed

from the pink, which he accuses of having no power of invention at all.

Ordinarily we think of the pink as having a pink flower, and, if we reflect at all, that the color we describe as pink lends its name to the flower; but the etymologists mostly disagree therewith. They declare that the pink is the lender and not the borrower, and that the color owes its name to the fact that it so closely imitates the flower. It is said that the word pink as applied to the flower is derived from the verb "pincken," meaning "to scallop," so that the flower borrows its name from an act and transfers it to a color. We habitually use the word pink to express our highest ideals along many lines, thus unconsciously paying high tribute to this beautiful little flower and its relatives. A woman we may describe as the pink of perfection and a man as the pink of courtesy.

COMMON EVENING PRIMROSE
(Œnothera biennis L.)

(See page 489)

Who has not seen the common evening primrose with its pale yellow flowers "luikin out o' their leaves like wee sons o' the sun" has missed a sight that has gladdened millions of hearts.

In the United States the evening primrose is a hardy warrior in the competition for existence and is not over-particular as to where it is stationed on the battle-front. Roadsides, dry fields, thickets, and the corners of the old-fashioned worm fence are satisfactory stations for it, and it is equally at home in Labrador and Florida and as far west as the Great Plains Mountains.

It is when the sun goes to bed that the evening primrose's morning dawns. It is one of the denizens of the Great White Way of the Flower City, waking while the world sleeps and sleeping while the world wakes.

As the sun approaches the western horizon the evening primrose awakes and bedecks itself in yellow and white, perfumes itself up with the most seductive of sweet-scented odors, and prepares to welcome the sphinx moths that come to tarry and to sip its sweetness through the long and silent night.

Before the dusk grows deep we may behold the visitors arriving and departing and the grand reception in full sway. Now comes a beautiful little moth dressed in rose pink, its wings bordered with yellow; now the Isabella tiger-moth, and now another and another. All of them have long tongues, though it has never been charged that they use them for gossip. The nectar cup of the evening primrose is deep, and the short-tongued moth stands a chance of going hungry.

The primrose, though it revels in the night, is yet somewhat stingy with its favors, for often it will open up only one flower to each stalk. It does this to insist that its messengers who feast on its nectar shall carry its pollen to a flower on another plant.

One night of revelry is enough for a flower of "milady primrose," for when morning dawns the corolla wilts, hangs awhile, and then drops away; and when we see her next day the freshness is gone, and she presents the appearance of one whose dissipations have laid heavy toll upon her.

But if by any chance no visitor has come during the night to sip its nectar and to be pollen-bearer for it, the primrose does not close when the moths retire at dawn, but keeps open house for an hour or so in the morning, unti the bees can repair the neglect or until a humming-bird can pass its way on her rounds. Toward the end of summer, after a sufficient number of seeds have set to insure the future, the primrose becomes more generous of its sweets and often bids welcome to the bees the whole live-long day.

The evening primrose must not be confounded with the true primrose of England and the poets, a very different plant, belonging to a different family.

STAR GRASS (Hypoxis hirsuta (L.) Coville)

(See page 490)

The yellow star grass is a quiet and modest little flower that asks only for a chance to live in the dry open woods and fields, gleaming out of the turf by day as the stars gleam out of the heavens by night. From May to October it shines out of the landscape, and it finds but few parts of the United States where it cannot dwell prosperously.

Usually only one of the tiny blossoms on a stalk opens at a time. The others wait their turn, each hoping that those ahead may have the honor of entertaining the tiny bee that delights in their sweets and pays them back in pollen-bearing messenger service. But if a flower "blushes unseen" by the bee for too long a period, it grows tired of "looking and hoping," gives up its ambition for cross-fertilization, and, folding itself as the Arab folds his tent in the night, it brings its own pollen-laden anthers into contact with its own stigma, and thus produces self-fertilization as a last resort against death without posterity.

But if the bee comes the flower is happy, and offers its visitor not only its nectar, but gives it pollen to carry to its home as flour for the bee-bread which the bee's tiny babies must have.

Nature's frugality is revealed in the case of the star grass. When its flower is upright and almost closed, she paints its outside with green color; but when the blossom is spread out the inner side of the petals display the chief decoration.

WILD GERANIUM OR CRANE'S-BILL
(Geranium maculatum L.)

(See page 491)

This graceful flower, purplish pink or lavender in color, comes in April and goes in July. It has a preference for woods, thickets, and shady woodsides, and does not seek the

open field with its hot sunshine As far north as Newfoundland, as far south as Georgia, and as far west as the Father of Waters it finds hospitable grounds on which to dwell.

Legend tells us that the geranium is a miracle-made descendant of the mallow. It relates that once the prophet Mohammed had occasion to wash his shirt on the bank of a stream. He then laid it on some mallows to dry. When they discovered the fact that theirs was the honor of supporting the garment of the Prophet, they blushed at the thought of such distinction and turned forthwith into geraniums, which they have remained ever since.

The wild geranium depends entirely upon the bees for its propagation, since it has reached that stage of plant development which renders it incapable of self-fertilization; the pollen is ripe and the anthers have fallen away before the stigma becomes receptive. It is a plant that shoots, so to speak; for when the seeds are ready to be spread abroad, the pod, under the process of drying out, sets a spring; when the seeds are dry enough and hard enough to fare for themselves in the world, the trigger to this spring is pulled by the drying process and the seeds are catapulted some distance.

For generations the world knew nothing of the community of interest between the plant kingdom and the insect world; and then Sprengel, the great botanist, observing the German cousin of the American wild geranium, came to the conclusion that the flower is fertilized by the transfer of pollen by the insect that comes to partake of its nectar.

It was many years later, long after Sprengel had been gathered to his fathers, that Darwin came along with conclusive evidence that Sprengel had told the truth, though not the whole truth. He showed how cross-fertilization is accomplished by insects, and that in the competition for existence the cross-fertilized plant has a great advantage over the one that is self-fertilized.

The plant that led Sprengel to guess at the intimate relationship between the insect world and the flowery kingdom was an unfortunate one for him to put forth to substantiate his case, since he had supposed that the insect caused the flower to fertilize itself, whereas it always protects itself against that very thing. He had not gone far enough with his reasoning to understand that cross-fertilization is the rule and self-fertilization the exception among flowers.

It is generally thought that only the larger bees are the wild geranium's benefactors, for the ordinary little yellow butterfly that one sees along the mud puddles on the country road is a pilferer, while the small bees more often than not drink its nectar without coming in contact with its pollen.

COMMON DAY FLOWER (Commelina communis L.)

(See page 492)

The common day flower, loving moist, shady ground, has established itself as a Pan-American blossom. Its range is from southern New York down through tropical America all the way to Paraguay. It is a member of the spiderwort family, and its delicate blue flowers win admiration alike from man and bee. The day flower is an early riser. Its blossom is open and its latch-string out as soon as the bees begin to stir. By noon they have searched is out, gathered its pollen, sipped of its nectar, and paid its toll of fertilization. As soon as this has been done, its lovely petals roll up and wilt into a wet and shapeless mass, never to open again.

The Latin name of the common day flower, "Commelina," was given it by Linnæus, the great Swedish botanist. He had three friends, the Dutch botanists Commelyn. Two of the brothers were active and persistent in their work and published the results of their investigations. The third brother, Kaspar, was a deep student, but lacked the energy required in the publication of scientific work. Noting the three petals on the blossom of the day flower, the two of them bright, conspicuous, and attractive, and the third lacking in all those qualities, he named the flower after the brothers to typify their work in life, and the name will doubtless go down to the end of time to remind the world of the lack of ambition and application of Kaspar Commelyn and the energy of his brothers. Kaspar never lived to read the little joke in print, for he died in 1731, before "Species Plantarum" appeared.

The blue flower of the day flower was believed by Sir John Lubbock to represent the spirit of striving to please that the flower shows to the bees. After a prolonged study of the evolution of flowers, he came to the conclusion that all blue flowers have descended from ancestors in which the flowers were green; or, to speak more precisely, in which the leaves surrounding the stamens and pistils were green. As their generations went by they became white or yellow, and in succeeding ages gradually brought themselves around to red. From the red they began to turn blue, and a study of all of the flowery kingdom indicated to him that the ultimate rôle of excellence to which the flowers aspire is that they shall be arrayed in blue.

BLACK-EYED SUSAN (Rudbeckia hirta L.)

(See page 493)

Fighting her way across the American Continent, black-eyed susan has proven the master of the allied forces of man and nature. In the competition of life she has been able to make a home wherever she sets her foot, and neither the rivalries of the field nor the laws and labors of man have been able to hold her in check.

Black-eyed susan loves dry fields and open, sunny places, and can hold her own with the white ox-eye daisy and the wild carrot in dry weather. Its flowering season is long, opening in May and closing in September. It is one of the little vagrants that has traveled

from the west to the east along the highways of commerce. In years gone by much clover seed was shipped out of the West, and black-eyed susan hoboed her way along with it. Most of the weeds of the field have traveled along with the star of the empire, from the east to the west; but black-eyed susan has reversed the natural order, and already has secured a footing in European flower gardens, if not in European fields. As one authority puts it, "By the middle of July our dry meadows are merry with black-eyed susans, which are laughing from every corner and keeping up a gay midsummer carnival in company with the yellow lily and brilliant milkweeds. They seem to live in long days of blazing sunlight and are veritable salamanders among the flowers."

Black-eyed susan is one of the most liberal of all the entertainers in the flower world. Bees, wasps, flies, butterflies, and beetles all gather around her festive board, and although the nectar deep down in her tubular brown florets can be found only by the insect with a long and slender tongue, her pollen is accessible to all.

Feeling so richly provided with methods that assure fertilization to her blossom, black-eyed susan inevitably sets many seeds. The result would be a prolific reproduction, even though there were not artificial agencies upon which it could rely for its dissemination. The farmer who stores hay in his barn carries the seeds of black-eyed susan wherever that hay may go, and the one who sows grass seed of any kind, unless he is exceptionally careful to have his seed free from filth, will spread black-eyed susan broadcast along with his grasses.

In these days of wide-spread warfare in Europe, we hear much concerning barbed-wire entanglements and all sorts of defensive works of a similar nature. Black-eyed susan long ago learned to defend herself from would-be pilferers in much the same way. If you will observe her closely you will find her stem full of tiny thistle-like bristles. No creeping creature stands any show of getting past these defenses and up to the nectaries of the flower, because black-eyed susan long generations ago learned that they are not able to serve as pollen-bearers in exchange for her nectar.

THE JEWEL WEED OR TOUCH-ME-NOT (Impatiens pallida Nutt.)

(See page 494)

Though somewhat rarer than its close relative, the spotted touch-me-not, the jewel weed, or pale touch-me-not, is a common plant of wet and shady situation in the northern part of the eastern United States. It reaches as far south as Georgia. Its flower is somewhat bell-shaped, almost as broad as long. It develops its stamens first and its pistil afterward, so that self-fertilization is almost impossible and cross-fertilization a usual thing. Late in the season, after the brilliant jewel-like flowers have gone, they bear inconspicuous blossoms which fertilize in the bud and are called *cleistogamus* flowers. It thus becomes, in a measure, independent of its insect guests for fertilization; but, realizing that degeneracy follows close in-breeding among plants as well as animals, it tries to have as many seeds set by cross-fertilization as possible. It is a curious fact that in England, where there are no humming-birds, the native jewel weed, nineteen times out of twenty, produces cleistogamus flowers instead of showy blossoms, and that even when producing the showy blossoms they seldom set seed. Many botanists have wondered whether this does not look like a determination on the part of the plant to secure a firm foothold in its new environment before expending its energies on flowers which, though radiant and attractive, are quite dependent on insect facilities for fertilization and perpetuation.

The jewel weed belongs to the seed-shooting family of plants. Its seed capsule is connected with a delicate hair trigger, and at the slightest touch this sets the seed-spreading mechanism to work with a suddenness that makes one jump. It is from this hair-trigger arrangement that it gets its popular name of touch-me-not. Often the seeds are catapulted a distance of four feet or more.

BULB-BEARING LOOSESTRIFE (Lysimachia terrestris (L.) B.S.P.)

(See page 495)

The bulb-bearing loosestrife, if it were as efficacious as legend declares, might be used with effect in Europe today. This legend is the basis of its popular name—a loosing of strife. It is said that in ancient times yokes of oxen were rendered gentle and submissive by attaching a loosestrife plant to the tongue of the cart.

This plant is to be found blooming from July to September in open woodland and along roadsides. It prefers a moist, sandy soil and finds hospitable surroundings in almost the entire eastern half of the United States and Canada. Its yellow flowers are dotted with reddish spots. The slender flower spike is distinctly characteristic; it forms an aggregation of misty yellow color (when a large colony of plants is seen) which is never to be found with other species. Often little elongated bulblets appear at the base of the leaves, and this caused Linnæus to mistake the plant for a mistletoe that grew on the ground.

EASTERN BLUE-EYED GRASS (Sisyrinchium graminoides Bicknell)

(See page 495)

The violet-blue eastern blue-eyed grass, flowering in May and June and lending its beauty to the coastal region from Maine to Florida, is a charming member of the iris family. It is a tall, bending species, with a slender stalk sometimes two feet long. It has been called a little sister of the stately blue flag. Only on bright days do its flowers venture out, and then only one at a time. On being gathered, this

little "eye bright" of the fields promptly closes its eyes and refuses again to open them except under the persuasion of the sunshine itself. The flower of the blue-eyed grass not only takes the sunshiny day to come out, but after that one day is past it closes its eye never to again open it.

CARDINAL FLOWER OR RED LOBELIA (Lobelia cardinalis L.)

(See page 496)

Throughout the eastern United States and Canada and as far west as Kansas the red lobelia is one of the most striking of the country's wild flowers. It blossoms from July to September and its favorite haunts are wet, low grounds beside streams and ditches.

Called the cardinal flower, the red lobelia excels its namesake of birddom in the richness of its colors.

The lobelia was named after Mathis de Lobel, a native of the French city of Lille, who was botanist and physician to James I. The plant has a certain pharmacological resemblance to tobacco. In large doses it is a powerful gastro-intestinal stimulant, causing giddiness, headache, nausea, and extreme prostration, with clammy sweats and irregular pulse.

The closest friend of the red lobelia is the humming-bird, and while the bees sometimes visit it they are never its most welcome guests. Sir John Lubbock, the great English scientist, many years ago presented to the world a striking example in the lobelia of the tendency of plants to color themselves to delight the eyes of their favorite visitors. He found that the humming-bird has a peculiar affinity for red, just as the eye of the bee is delighted with blue. It therefore happens that the shallow-cupped lobelia, which looks mostly to the bees for carrying its pollen, is blue, while the deep-cupped lobelia, whose nectar can be sipped only by the long-billed humming-bird, is red.

The humming-bird reminds one of Eugene Field, who, when asked what his favorite color was, replied: "Why I like any color at all so long as it is red!" Some botanists believe that scarcity of red flowers is due to the fact that there are so comparatively few humming-birds, and it is noted that red flowers are fewer where humming-birds are scarcest, showing again the particular community of interest between the flower and nectar-sipping creatures.

SWAMP OR MARSH BUTTERCUP (Ranunculus septentrionalis Poir.)

(See page 497)

One of some 250 species of the crowfoot family, the swamp or marsh buttercup flowers from April to July. Its range is from Georgia and Kentucky northward, and it seldom is found outside of the confines of swamps and low, wet ground. Its flowers are a deep yellow and fully an inch broad. The stem is hollow and generally smooth, though in some instances it has developed fine hairs. This buttercup is very variable in both size and foliage. It depends mainly upon bee-like flies and very small bees for fertilization. Many of the members of the buttercup family are naturalized flower citizens of North America, having come in from Europe as immigrants many years ago. The marsh buttercup preserves itself from in-breeding by putting out only a few blossoms at a time, thus making more or less certain its cross-fertilization.

The swamp buttercup is not to be mistaken for the common meadow buttercup, which has first place among the members of the family in distribution and hardiness. The marsh buttercup has longer petals and sometimes spreads by developing runners, while the stem of the meadow buttercup is nearly always erect and propagation depends entirely upon seeds. The meadow buttercup has such an acrid flavor and such caustic propensities that cattle will not eat it. In this it follows the example of most of the members of the crowfoot family in secreting such bitter and poisonous juices that they get a wide berth from animal kind. It is said that the juice of the meadow buttercup is capable of raising blisters, and that beggars use it to produce sores upon their skins. The members of the crowfoot family borrow their botanical name from *rana*, which means a frog. It was alleged by Pliny that the buttercup stirs him who eats it into such a gale of laughter that he scarce can contain himself. He further states that unless the eater washes it down with pineapple kernels and pepper dissolved in date wine, he may guffaw his way into the next world in a most unseemly manner.

According to historical authorities, one species of buttercup was used by the ancients to poison their arrows, while the double crowfoot, or St. Anthony, would cure the plague if rubbed on the spot most affected, and was good for lunacy if applied to the neck in the wane of the moon, when it was in the sign of the bull or the scorpion.

AMERICAN HOLLY (Ilex opaca Ait.)

(See page 498)

A small, slow-growing evergreen tree, with tiny greenish or yellowish white flowers and round red berries, the American holly loves the moist thickets and is to be found from New England to the Gulf of Mexico and as far west as Texas. The flowering season of this tree is from April to June. Its leaves are thick, rigid, glossy, and edged with spines.

There are many interesting customs and romantic stories in which the holly figures. It is believed that the custom of employing the holly and kindred plants for decorative purposes at Christmas dates back to the time of the Roman Saturnalia, or else to the old Teutonic custom of hanging the interior of dwellings with evergreens as a refuge for sylvan spirits from the inclemency of winter. Even in Pliny's day the holly had all manner of

supernatural qualities attributed to it. Its flowers were said to cause water to freeze; it was believed to repel lightning, and therefore the Romans planted it near their houses; and the story ran that a branch of holly thrown after any stubborn animal, even though it missed him, would serve to subdue him instantly and cause him to lie down meekly beside the stick. Some friends of the holly have suggested that the notion of the Italian peasant that the cattle kneel in their stalls at midnight on the anniversary of Jesus' birth grows out of the survival of the old pagan legend of the effect of the holly upon domestic animals.

In parts of England it is deemed unlucky to introduce the holly into the house before Christmas eve. In some sections the prickly leaf and the non-prickly leaf species are designated as "she" and "he" holly, and the belief is that, according as the holly brought at Christmas is smooth or rough, the wife or the husband will be master of the household for the ensuing twelve months.

The European relative of the American holly has a leaf more spiny and a berry of a deeper red than our own, but it is too tender to withstand the rigorous winter of the North or the hot summers of the South.

VIRGINIA or SCARLET STRAWBERRY (Fragaria virginiana Duchesne)

(See page 498)

Who has not gone out into the shady open woodlands and gathered wild strawberries, as toothsome as they are beautiful, has missed one of the charming experiences of life in the country. Its white, loosely clustered flowers; its broad, oval, saw-edged green leaflets, and its glistening red berries make a combination that delights the eye of the most unsentimental. "Doubtless God could have made a better berry, but doubtless He never did," declared the patient fisherman, Izaak Walton, who was also a connoisseur of things to eat. And whoever has tasted a strawberry that represents the last word of the plant breeders' art, and then the strawberry of the open woodland, will agree that cultivation has added nothing to flavor, however much it has added to size. The Duke of Gloucester, who became Richard III, had a weakness for the wild strawberry. It is said that in 1483, as certain great lords were sitting in counsel arranging for his coronation, the duke came in and, "saluting courteouslie, said to the Bishop of Ely: 'My lord, you have verie good strawberries in your garden in Holborne; I require you to let me have a mese of them.'"

It is said that during the reign of Henry VIII the price of strawberries was eight cents a bushel.

The favorite haunts of the Virginia strawberry are in dry fields, along roadsides, and in open woodlands. It flourishes from Nova Scotia to the Gulf of Mexico and has secured a foothold as far west as the Dakotas.

The berry of the strawberry is a false fruit. It is the tiny pincushion-like receptacle of the strawberry flower that fleshens and reddens into the fruit.

The strawberry sends out many children in the shape of runners. These tiny runners take root in the ground, and as soon as they get a firm foothold, the connecting stem promptly wilts and the baby strawberry plant is set loose to fight its own battle in the world. How prolific this strawberry plant may be is strikingly shown by an experiment made some years ago. One plant in three years developed 200 plants, which covered more than seventy times as much ground as the progenitor of the family.

Many people regard the strawberry as the most healthful of fruits. It was the firm conviction of Linnæus that they cured his gout, while others have found them beneficial in fevers and bilious disorders. They are said to have a very excellent effect upon the teeth, dissolving the tartar that gathers upon them.

WILD YELLOW LILY OR CANADA LILY (Lilium canadense L.)

(See page 499)

The boundaries of the wild yellow lily's American domain reach from Nova Scotia on the north to Georgia on the south and the western half of the Mississippi Valley on the west. It flowers in June and July and most often is found in low meadows, although it thrives in swamps and fields to some extent.

With its pendulous, brown-dotted, buff-yellow blossom hanging so as to protect its nectar from the rain, the yellow lily is a favorite friend of the wild honey-bee and the leaf-cutting bee, which visit the flower to gather its brown pollen as well as to sip its nectar.

When the Master, in His magnificent Sermon on the Mount, bade the world to "consider the lilies of the field," He did not refer to the lilies we know, but how well does His injunction fit; for what richer lessons can we gain from nature than by studying the life, form, and behavior of the lilies that render such helpful aid in lending enchantment to the summer by their beautiful nodding bells, which seem to toll the hours of flowerland! Less gorgeous, it is true, than its beautiful sister, the Turk's cap, the wild yellow lily still justifies the inspired verdict that Solomon in all his glory was not arrayed as it. Some have called the bell-like flowers of the yellow lily "fairy caps," while others have called them "witch caps." But whether the fairies or whether the witches adorn themselves in such dainty headgear, we know that the bee often uses the flower for a "shelter in the time of storm." Some one has said that the form of the lily stock and flower suggest an exquisite design for a church candelabra.

Among all races and in all ages the lily has been a favorite of man. In both tradition and in legend it has played its rôle. The tomb of the Virgin was filled with lilies to allay the doubts of the ever-doubting Thomas. The Greeks and Romans considered the lily a sym-

bol of purity, and the Easter lily is the symbol of the Christian faith in the hope of a life beyond the grave.

TURK'S CAP LILY (Lilium superbum L.)

(See page 499)

Lilium superbum is the Latin name for that beautiful flower we call the Turk's cap, and it deserves the name, for of all the "lilies of the field," it is tallest, stateliest, most prolific of bloom, most variable in form, color, and size. Its domain reaches from Maine to the Carolinas and westward to and including Tennessee and Minnesota. Like many other wild flowers, it loves to be petted by the horticulturist, and responds with wonderful alacrity to good treatment. Growing wild, from three to seven leaves appear in a terminal group on the lily stock. Pampered by the horticulturist, it will crown itself with as many as 40 blossoms and grow to a height of 9 feet. July and August are the months when the Turk's-cap lily lends its flowers to the enrichment of the landscape.

WITCH HAZEL (Hamamelis virginiana L.)

(See page 500)

With its home in thicket and low-lying woodland and its range reaching from Nova Scotia to the north of Mexico, the witch hazel is the rear guard of the flower army that marches in panoplied splendor through the spring and summer and fall. Where the trailing arbutus, the jonquil, the crocus, and the buttercup lead the invading hosts of beauty, the witch hazel is so far behind the procession that one might almost wonder whether it be rear guard or straggler.

It follows the fringed gentian, whose beauties have been acclaimed by many poets, and it seldom lends its blossom to the scene before September is well on toward the equinox. From that time until Christmas, even, it gladdens the wood. Surely one may feel when beholding it that time has indeed "grown sleepy at his post and let the exile summer back," or else that it is "her regretful ghost" that stalks abroad. The witch hazel is about the last feast that nature prepares for the insect world. Even its leaves have gone, and it has joined the ranks of the "brown and sere" before its flowers come.

As soon as the insect hosts have rendered their toll of pollen-carrying in exchange for the nectar of the flower, it begins to fade and fall. Then comes the seed pod, which hangs on to the tree all the year following, and does not turn loose its seeds until the witch-hazel flowers come again. Then the large, hard, black seeds are discharged through the rupture of the capsule, whose walls pinch them out. They are discharged with enough force to sting the face sharply if they hit an observer. Thoreau once wrote that he heard in the night a strange snapping sound and the fall of some small body on the floor from time to time. Getting up to investigate, he found it was produced by the witch-hazel nuts on his desk springing open and casting their seeds across his chamber.

We owe our knowledge of the value of witch-hazel bark for medicinal purposes to the Indians, and it is now used in the making of many kinds of extracts.

For generations the branches of the witch hazel have been used as divining rods for the location of waters and precious ores.

A good story is told on Linnæus in relation to the divining rod made of the branches of the European cousin of the American witch hazel. On one occasion, on one of his trips, his secretary highly extolled the powers of a witch-hazel divining rod. Linnæus was sure that it had no virtue, and to prove it concealed a purse containing one hundred ducats under a flower which grew by itself in a meadow. The divining rod could not locate it, and the assembled company, watching the experiment, trampled down the plant under which it was hidden. When Linnæus went to take it from its hiding place, he could not locate it. His secretary again brought his divining rod into play and told him that it lay somewhere in the opposite direction. Going in the direction the divining rod pointed, Linnæus finally found his gold, and declared that another such experiment would be sufficient to make a proselyte of him.

WOODY NIGHTSHADE OR BITTERSWEET (Solanum Dulcamara L.)

(See page 501)

Like the great bindweed, the woody nightshade has almost girdled the globe in the northern hemisphere. In the United States it has followed the northern part of the country as far westward as Kansas. It is also found in Canada and came to us as a plant immigrant from Europe. It belongs to the potato family and is also a relative of the tomato and the egg-plant. It used to be asserted that the berries were poisonous, even to the touch. Thoreau declared "they hang more gracefully from the river's brim than any pendant in a lady's ear, yet they are considered poisonous; but not to look at, surely. . . . But why should they not be poisonous? Would it not be bad taste to eat these berries which are ready to feed another sense?" It loves the moist thicket and fence row and flowers from May to September. Possessed of no nectar with which to attract the insects, the purple flowers of the nightshade are wall-flowers in the carnivals of floral beauty, and they get few visits from the gallants of the insect world.

PURPLE FLOWERING RASPBERRY (Rubus odoratus L.)

(See page 502)

Growing in rocky woodlands, dells, and shady roadsides, flowering from June to August, and claiming as its own a territory reaching from northern Canada to southern Georgia and from the coast to Michigan and Tennessee, the purple flowering raspberry has a beauty all

its own; yet so closely does it resemble the wild rose that many a passerby confounds it, although a glance at the undivided leaves would correct such an error. Although it is called the purple flowering raspberry, it is quite incapable of producing a true purple flower. At first its color is deep crimson pink, which finally fades to an unattractive magenta pink. The large leaves are three to five lobed and a trifle hairy. The fruit is insipid and resembles the flat red raspberry. Some people call it the thimble berry.

The leaves of the purple flowering raspberry are rather large and children often fold the lower ones, which sometime measure a foot across, and make drinking cups of them.

This flower is the "poor relation" of the exquisite wild rose; yet even at that, when its bright blossoms burst forth in rich confusion at the edge of the woods, it lends enchantment to the scene.

BLACK HAW OR STAG BUSH (Viburnum prunifolium L.)

(See page 503)

The boy who has not wandered through woodlands and gathered and eaten the smooth bluish-black, sweet and edible fruit of the black haw has missed one of the pleasures of boyhood. The black haw is a very early bloomer, the flat-topped whitish clusters appearing in April and lasting until July. The black haw has it range between the Gulf States and New England and Michigan.

The black haw belongs to the honeysuckle family.

PURPLE LOOSESTRIFE (Lythrum Salicaria L.)

(See page 504)

An immigrant from Europe, loving wet meadows, marshy places and banks of streams, and flowering from June to August, the purple loosestrife has secured a foothold in North America and thrives from eastern Canada to Delaware and from the Atlantic seaboard to the Middle States. So beautiful is it that many are ready to forgive Europe for all the weeds it has sent us, when they see an inland marsh in August aglow with this beautiful flower born to the royal purple. The purple flowering loosestrife is different from any other heretofore mentioned, because it has what are known as trimorphic flowers. Being unable to set seed without the aid of insects, the purple flowering loosestrife has devised a most ingenuous sort of arrangement to make sure that it shall not pass away until its flowers have been fertilized.

This plant produces six different kinds of yellow and green pollen on its two sets of three stamens; these six different kinds of pollen are deposited on the stigmas, which are of three different lengths. Darwin showed that only pollen brought from the shortest stamen to the shortest pistil and from the other stamens to the pistils of corresponding length could effectually fertilize the flower. He found that the reproductive organs when of different length behaved toward one another like different species of the same genus, both with regard to direct productiveness and the character of the offspring. When he made his famous discovery concerning the trimorphism of the loosestrife, he wrote to Gray, the botanist: "I am almost stark, staring mad over Lythrum; . . . for the love of heaven have a look at some of your species, and if you can get me some seeds, do."

Dressed in such bright-hued clothing and secreting abundant supplies of nectar at the base of its flower tubes, it is natural that many insects should seek out the purple loosestrife. When visiting the flower, they alight on the stamens and pistils of the upper side first.

MOTH MULLEIN (Verbascum Blattaria L.)

(See page 504)

Belonging to the figwort family, other members of which are the great mullein, the blue toad-flax, the butter-and-eggs, the small snapdragon, the turtle-head, the beard-tongue, the monkey-flower, the false foxgloves, the eyebright, the yellow rattler, the lousewort, and the cow-wheat, the moth mullein is another of those hardy immigrants of the weed world that has traveled up and down the lanes of international commerce, gained a foothold in the United States, and overrun the country almost from ocean to ocean and from lake to gulf. For it the marsh and meadow have little attraction. It prefers the dry, open land of roadside and field, and while the grass of the pasture may be parched in the dry, hot dog-days, the moth mullein, like its larger sister, the great mullein, is somewhat akin to the cactus in its ability to resist drought. If all of the cultivated plants that grow in garden and on farm could defy dry weather with as much success as the mullein, every year in America would be a bonanza crop year. The flowering time of the moth mullein is from June to November. It is one of those plants that have learned to take advantage of the kindness of the agriculturist, as it always stays close to the haunts of man and never thinks of taking to forest and mountain for a habitat.

The moth mullein for many a year has been a rural moth-ball. The country-dwelling housewife has used its leaves in packing away woolen garments of winter to keep out the tiny cloth moths of summer. It is also believed to be a bane to cockroaches, from whence comes the latter part of its scientific name.

John Burroughs was able to see much beauty in the moth mullein in spite of its belonging to the category of weeds. He once declared it a favorite of his, which reminds one of a remark of Dr. Liberty Hyde Bailey concerning the dandelion. He declared that mental attitude has much to do with the attractiveness of flowers—that if a man could only bring himself to think so a dandelion might be as fair a touch to a lawn as a hyacinth. It is also a curious fact that the white ox-eye daisy and the black-eyed susan, which are admired so

much for their beauty and their decorative value, are detested by the farmer, who has to fight them in season and out to prevent them, along with the ragweed, the plantain, and many other weeds from taking possession of his fields and ruining his crop of hay.

SHOWY LADY'S-SLIPPER (Cypripedium reginae Walt.)

(See page 505)

Living in peat-bogs, or in rich, low, wet woods, flowering from June to September, and having a range that reaches from Nova Scotia to Georgia and from the Atlantic to the Mississippi, the showy lady's-slipper, a member of the orchid family, has been voted by Dr. Gray the most beautiful belle that ever came out from beneath an orchid roof tree. It never seeks the haunts of man, but tries to remove itself as far from their comings and goings as it can, and it succeeds so well that only the flower lover who is willing to take pains can approach its dwelling-place and behold its liberty in its native environment.

Further than this, it is so persistent in its efforts to be let alone that it has come to have tiny glandular hairs which contain an oil that is somewhat poisonous to the human skin, and it is said that a number of cases of dermatitis have followed the efforts of flower lovers to carry it in triumph out of the woods.

As a member of the orchid family, the showy lady's-slipper shares the tradition of that family's origin, which is one that is neither beautiful nor attractive; for the first Orchis was the son of a nymph and a satyr, hence a fellow of unbounded passion. At a festival of Bacchus, being warm with drink, he attacked a priestess; whereupon the whole congregation fell upon him and rent him limb from limb. His father prayed the gods to put him together again, but the gods refused, tempering their severity, however, by saying that whereas the deceased had been a nuisance in his life, he should be a satisfaction in his death; so they changed him to the flower that bears his name. Even the flower was alleged to retain temper, and to eat its root was to suffer momentary conversion into the satyr state.

THE TWIN BERRY OR PARTRIDGE BERRY (Mitchella repens L.)

(See page 506)

Another of the truly "wild" flowers that asks man only to be let alone in the fastness of the forest is the twin berry, which is a member of the madder family. Strange to say, it is a distant relative of the coffee and the cinchona tree, and also of the madder, whose fruits furnish the red dye and the artist's permanent pigment of that name. It is also a relative of the dainty little quaker-lady, the bedstraw, the goose grass, and the wild licorice. Its flowering season is from April to June and it sometimes fills a return engagement in the autumn. Its range is from Nova Scotia to the Gulf of Mexico and from the Atlantic seaboard to Minnesota and Texas.

The flowers of the twin berry have a system of securing cross-fertilization which is different from any of those heretofore described. This is known as dimorphism. There are two different kinds of flowers—the one has mature stamens and immature stigmas and the other has mature stigmas and immature stamens. By this process no flower can fertilize itself and must rely upon its insect benefactor to prevent it from disappearing from the world through lack of ability to mature its seeds. Short-tongued bees and flies cannot reach the twin berry's nectar because of the hairs inside the tube, but the larger bees and butterflies which suck the nectar from the flowers with the tall stamens receive pollen on the exact spot on their long tongues that will come into contact with the sticky stigmas of another flower.

The two flowers at the top of a branch grow united in such a way that they seem to be Siamese twins of flowerland. It is from the fruit resulting from this union that the twin berry gets its name. Experience is said to prove that when only one of the twin flowers is pollenized by insects fruit rarely sets as a result, but when both are pollenized a healthy seeded berry follows.

MAYFLOWER OR TRAILING ARBUTUS (Epigaea repens L.)

(See page 506)

The eastern half of North America, from Newfoundland and the Northwest Territory to Florida and the Gulf of Mexico, possesses that delightful little harbinger of spring, the mayflower or trailing arbutus. With its evergreen leaves nipped by the frosts of winter and weather-worn by the cold, relentless battle they must fight for existence through the grim winter, and with its flowers seeming to form nature's prelude to the fragrance of summer, from the days of Plymouth Rock itself the mayflower or trailing arbutus has gladdened the heart of man as it has proclaimed the dawn of spring. The poet tells us that the mayflower was the first sign that the Pilgrim fathers had that the winter was over; that the springtime was coming, and that the summer was appearing in the distance—not only the winter and the springtime and the summer, climatically speaking, but the winter of the Pilgrims' fear, the springtime of their hopes, and the summer of their dreams realized.

With all of its message of hope and cheer, as it proclaims the ending of the season of snow and harbingers the beginning of the season of bud and blossom, the mayflower still resists the effort of man to lead it into captivity. No more is the eagle at home in the farmyard or the cardinal in the cage than the mayflower in the garden. As the imprisoned cardinal pines away and dies when the gilded bars of a bird-cage separate it from its liberty, so the mayflower lives unhappily and unprofitably in the garden, and finally gives up its effort to adapt itself to its new environment as vain. However, man's patience and skill is finding a means of taming this wild flower (see page 518).

THE CULTIVATION OF THE MAYFLOWER

By Frederick V. Coville

Author of "Taming the Wild Blueberry"

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THE fruit of the mayflower, or trailing arbutus, is reputed to be of rare occurrence. Certainly it is rarely seen; it has hidden itself for centuries among the leaves and moss. To be found, it must be sought lovingly, if not indeed reverently, upon the knees. Furthermore, it must be sought at the right time, and that time is when wild strawberries are ripe.

It is a curious and remarkable fact that a plant so universally known and so well loved for the beauty, charm, and fragrance of its flowers should have been unknown as to the character of its fruit. Before the year 1913 none of our botanies adequately and correctly described it. The mayflower has not a dry pod, but a white-fleshed edible fruit as juicy as a strawberry, though of smaller size.

The Japanese have surpassed us in this matter, for they class their species of trailing arbutus as one of their edible wild fruits.

The secret of the mayflower fruit was known to one other also—that greatest of hunters, the ant. It is she who seeks the juicy pulp and bears the seed to new gardens on the bare, dull green soil of moist and shady hummocks.

The fruit of the mayflower is not in reality rare. I have found hundreds of them in a woodland pasture in New Hampshire in a single forenoon. (See the illustration by J. M. Shull, page 506.)

In an earlier article* were described certain experiments in the culture of that delicious but hitherto undomesticated fruit, the blueberry. It was found that this plant luxuriates only in soils so acid as to bring starvation to the ordinary plants of agriculture, and that it bears upon its roots a beneficial fungus which appears to nourish the plant in much the same way as the nitrogen-fixing bacteria in the root tubercles of clover nourish the clover plant. In the first trial plantation, in the pine barrens of New Jersey, blueberries are now produced of the size and color of Concord grapes.

A microscopical examination of the roots of the mayflower showed that it possessed the same sort of mycorhizal fungus as the blueberry, and as the two plants inhabit the same kinds of soil in their wild state and are similar in their geographic distribution, it was believed that the mayflower might respond to the same system of culture that had been successfully worked out for the blueberry. It was while searching for seeds with which to experiment that the remarkable character of the mayflower fruit was discovered.

In the most successful trials the seeds were sown while fresh in a mixture of two parts finely sifted upland peat, from laurel thickets, and one part of clean sand. The seeds sprout in about four weeks; and the plants, though exceedingly small at first, grow steadily under successive repottings, until at the age of 14 months they make rosettes about 5 inches in diameter, with flowering buds already formed. After exposure to cold weather during the winter they bloom freely. The flowers have the same fragrance and range of color as the wild ones, but larger size, some of them reaching seven-eighths of an inch in diameter; and the leaves are not so disfigured by insects as are those of the wild plants.

In their second year the plants reach a diameter of 12 inches and sometimes bear over 30 clusters of flowers.

It is useless to try the culture of the

* Taming the Wild Blueberry. National Geographic Magazine, February, 1911.

Photo by F. V. Coville

PHOTOGRAPH OF THE FIRST MAYFLOWER PLANTS, OR TRAILING ARBUTUS, GROWN FROM SEED

"The flowers have the same fragrance and range of color as the wild ones, but larger size, some of them reaching seven-eighths of an inch in diameter; and the leaves are not so disfigured by insects as are those of the wild plants. . . . It is to be hoped that the mayflower will become a familiar plant of woodland gardens and florists' windows, and thus be saved from the practical extermination with which it is threatened, and which indeed in the neighborhood of many of our cities has already actually occurred."

mayflower in a fertile garden soil or in any potting soil enriched by lime, manure, and fertilizer. Kindness of that sort is fatal.

Although florists are slow to take up the culture of new plants until popularity and profit are assured, there appears no reason, concerned with practicability or skill, why any competent flower-grower cannot repeat commercially with these plants what the writer has done in scientific experiment.

It is to be hoped that the mayflower will become a familiar plant of woodland gardens and florists' windows, and thus be saved from the practical extermination with which it is threatened, and which indeed in the neighborhood of many of our cities has already actually occurred.

Photo by Ernest L. Harris

THE PLAIN OF TROY, AT THE ENTRANCE TO THE DARDANELLES (SEE MAP, PAGE 532)

The plain of Troy today presents a very peaceful and pastural appearance. Beautiful valonia groves are everywhere in evidence, and the bark and nuts are exported in large quantities to foreign countries for tanning purposes. The old-time yoke of oxen tills the classic soil upon the banks of the Scamander now as diligently as at any time during the past 7,000 years.

HOMER'S TROY TODAY

By Jacob E. Conner

THE Trojan walls, unvisited by the idle tourist, are still in evidence; those same walls that defied the onslaughts of Agamemnon and Menelaus, of Ajax, Nestor, Diomed, Ulysses, and Achilles, to fall at last by stratagem. They remain as a ruined and abandoned stage minus its paraphernalia, whereon was played so many centuries ago an insignificant little drama compared with modern events; but it was a drama so big with human interest divinely told that the world has never known its equal.

Wars in these crowded modern times are for gain—for shameless gain—but in the youth of the world, *if we take the Iliad literally*, men could afford to fight for an ideal. Hence the Homeric warfare was a beautiful, a poetic pastime, seriously resulting to some happy few, who were thenceforth rewarded with immortality in song.

To be sure, it was all in the telling; and what would Troy have been without its Homer? Still, as the theater of the world's greatest epic poem, it deserves a visit any year, every year. In the thoughts and emotions it revives and stimulates, in the aroused sense of indebtedness of all subsequent literature and art, it richly repays a visit. The classical student will leave it in a daze of meditation upon things more real to him than the actual things he has seen and touched.

NEAR THE DARDANELLES

Let the narrator conduct you to Troy as he saw it, setting out from the village of Dardanelles for a five hours' hot and dusty ride, accompanied by a mounted Turkish escort. The road strikes timidly out from the village, following a course southward and approximately parallel to the coast, a mile or so distant. Along the plain moved dusty caravans, sometimes of dromedaries, sometimes of donkeys, bearing no spices or other valuable merchandise, but firewood, skins, and other local commodities, advertising unmistakably the poverty of the country. Scattered here and there were the encampments of the "muhajirs," or refugees from Macedonia—for the Balkan war was still in progress—living goodness knows how, for they had been driven from home and all they had possessed by the cruel and desolating struggle. Now and then a stork would rise from the tall grass near the watercourses, stretching his head forward and his feet backward, making that long, straight, horizontal line which so unmistakably marks his flight.

After a couple of hours' travel through the plain the road grows rougher and begins to ascend into hilly country. We should be nearing historic ground now, and we glance around the horizon to see if we can identify Mt. Ida, and toward the sea for a first sight of Tenedos; but no, this is only common soil. Soon we shall be upon the plains of Troy, and we peer anxiously over that next rise of ground in all expectancy. Rounding the summit, we see instead the road leading down into Eren Koui, a Turkish village, where we halt half an hour for coffee. Thence the road begins to wind through the village in a gradual descent until it makes a sudden jerky little turn into the open country, and behold! the plain of Troy is about us; not the plain of the historic action, but the drainage area which includes Troy.

The road, a beautiful government highway, well graded and well kept, leads straight toward a ridge in the distance, "the Hill of Ilium," at the lower point of which we shall presently see the ruins. It was down that identical ridge, or so we tell ourselves, there being no antiquarian present, that the angry god Apollo strode toward vengeance, while the arrows in the quiver on his shoulder clanged in ominous music.

Yonder the summit of Mt. Ida, where the gods in solemn conclave so often sat, where "cloud-compelling Zeus" sometimes "thought two ways in his mind at once," or else ended all debate with a nod

that shook high Olympus and caused the heavens to reverberate and glow with the flash of his thunderbolt.

Away over yonder, skirting the ridge of Ilium, is Simois' stream, or should be; but the bridge across it shows upon our approach that modern Simois is no more than a creek. Worse than that: following its attenuated course, less than a mile downstream, we discover that it ends in a morass instead of joining the Scamander as of yore. And the latter stream is scarcely less disappointing, for it is no more dignified in size or appearance. In fact, their sluggish currents united can scarcely boast of banks except at occasional intervals, for both streams are now only broad swales merging with the adjacent plain, with no continuous current toward the sea except in seasons of high water, if such are ever known.

And such beautiful plains! they were well worth fighting for, gently undulating as they retreat from the former river courses, and most homelike, cultivable places for peaceful abode. Little rounded oak trees are studded about the plain in solitary, independent fashion—oak trees resembling apple trees in size and periphery. Not many are the fields under cultivation, though an occasional patch of barley is to be seen; for there are too many Arabs, refugees, and other nomads in the country pasturing where they will. Poppies are in bloom of a most brilliant crimson. Yonder is a field of them, in appearance a field of blood, while here and there a solitary flower seems to mark the spot where one of Homer's heroes fell. The peaceful cattle are grazing about the plain, "whole hecatombs" of them if need were, herded by their far from peaceful-looking owners, who give us surly looks as we pass.

Behold the ruins at last! A long, low ridge, some four or five miles in length, ends abruptly like a promontory projecting into the sea, above which it rises about 30 feet. The ridge is the so-called "Hill of Ilium," the sea is the floodplain of the Simois and Scamander, historically known as the plain of Troy, and the promontory, with its crown of ruins, is Troy itself. You walk around the ruins and make the surprising discovery that if the walking were good you could easily do it in 10 minutes. Astonishing! Is this all there was of Troy, and did this little stronghold withstand a nine years' siege and still remain unconquered by force? Impossible! The whole Hill of Ilium may have been fortified and to some extent populated; otherwise how was the garrison provisioned? Unpoetic details like these never troubled Homer, so why bother about them.

Topping a mound of material thrown out from the excavations are the emplacements for two batteries of artillery. A company of Arab "irregulars" is on guard to hold the place for the Sultan, and these come forward, headed by their sheik and his staff. These wild children of the desert have all the inquisitiveness of their kind, and in spite of the presence of the escort, who saved us from ungentler things, no doubt, a leisurely examination of the place, free from intrusion, was not to be had.

Every student knows of the remarkable work of Schliemann in unearthing these ruins and establishing their identity as those of the veritable Troy of Homer; of the indefatigable zeal, the determined search for the location, the half-willing consent of the Turkish government, and the financial and physical obstacles to be overcome. But the work did begin at last, and the first walls to appear beneath the spade were strange walls, not those described by Homer, and the order was to dig deeper. Still further ruins of city after city were unearthed, till Homer's Troy, all that is left of it, was laid bare.

Only the antiquarian can see the significance of all these things as he scrambles up and down within and among these disordered piles of what once was masonry; but even an uninformed tourist can see the difference between the rubble walls of a later date and the worthier structures which preceded them.

There are walls, too, which show the marks of a mightly conflagration, and these, it is opined, are the same whence Æneas

> "Did from the flames of Troy upon his shoulder
> The old Anchises bear"

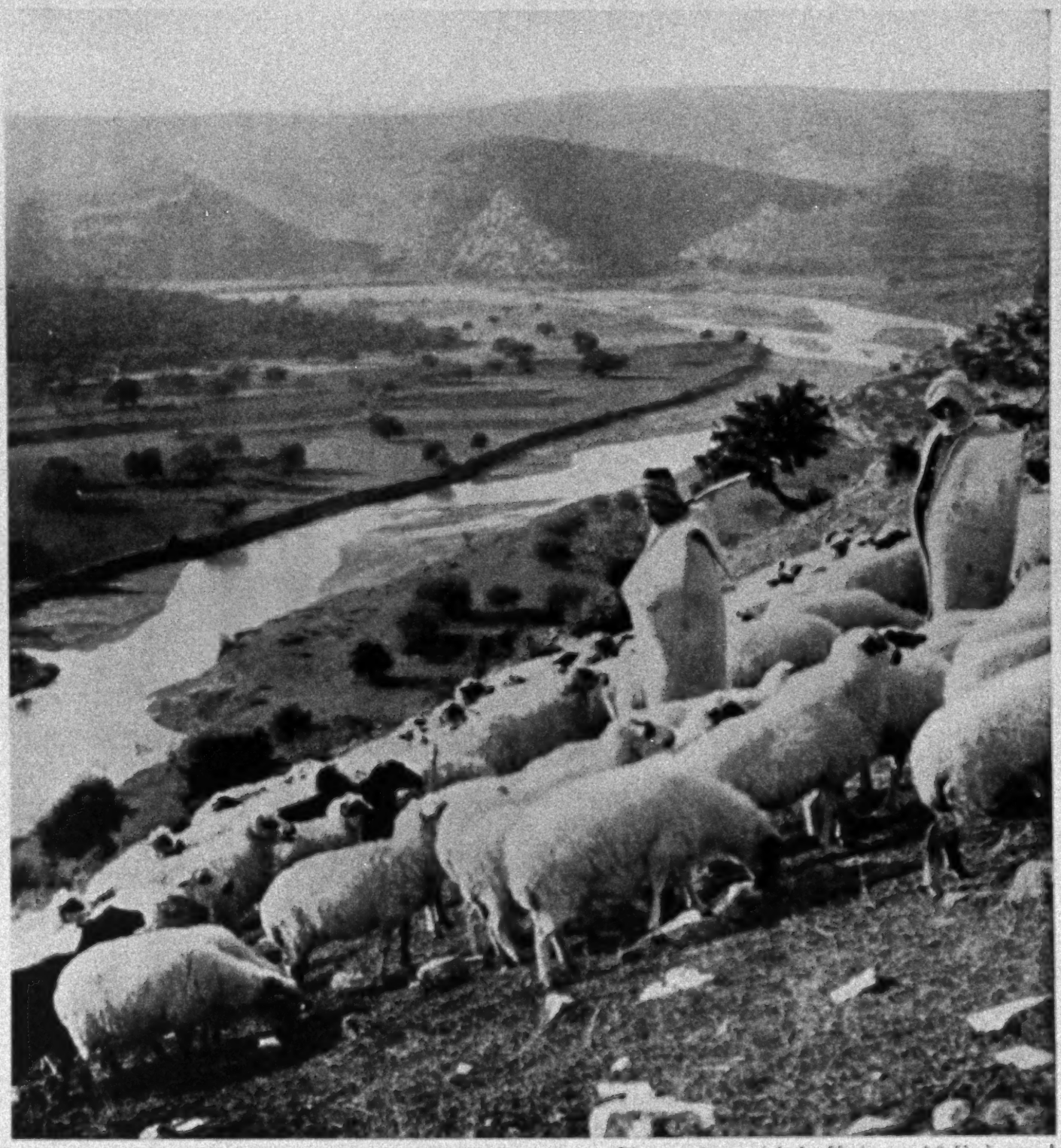


Photo and copyright by Underwood & Underwood

THE SCAMANDER RIVER OF HOMERIC FAME, LOOKING SOUTH FROM TROY TOWARD THE MOUNTAINS OF ASIA MINOR

on that last terrible night of destruction. One instinctively looks for the gap in the wall through which the wooden horse was introduced (oh, crafty Ulysses!), but he looks in vain. Earthenware cisterns of some 20 gallons capacity, for holding oil or wine, were built into the walls, while bits of iridescent glass, pieces of pottery, cobblestones, and clay were filled in around them. Corners of masonry formed by the intersection of interior walls were left standing by the excavators as not worth removing, and these are now crowned by tufts of stunted trees standing lonely to the view as one looks off toward Tenedos.

But there is still left one precious bit of Homeric architecture, if the archæologists are correct, raising its crown as high as any of the walls of subsequent date. It is part of a bastion facing toward the Hill of Ilium and known as the

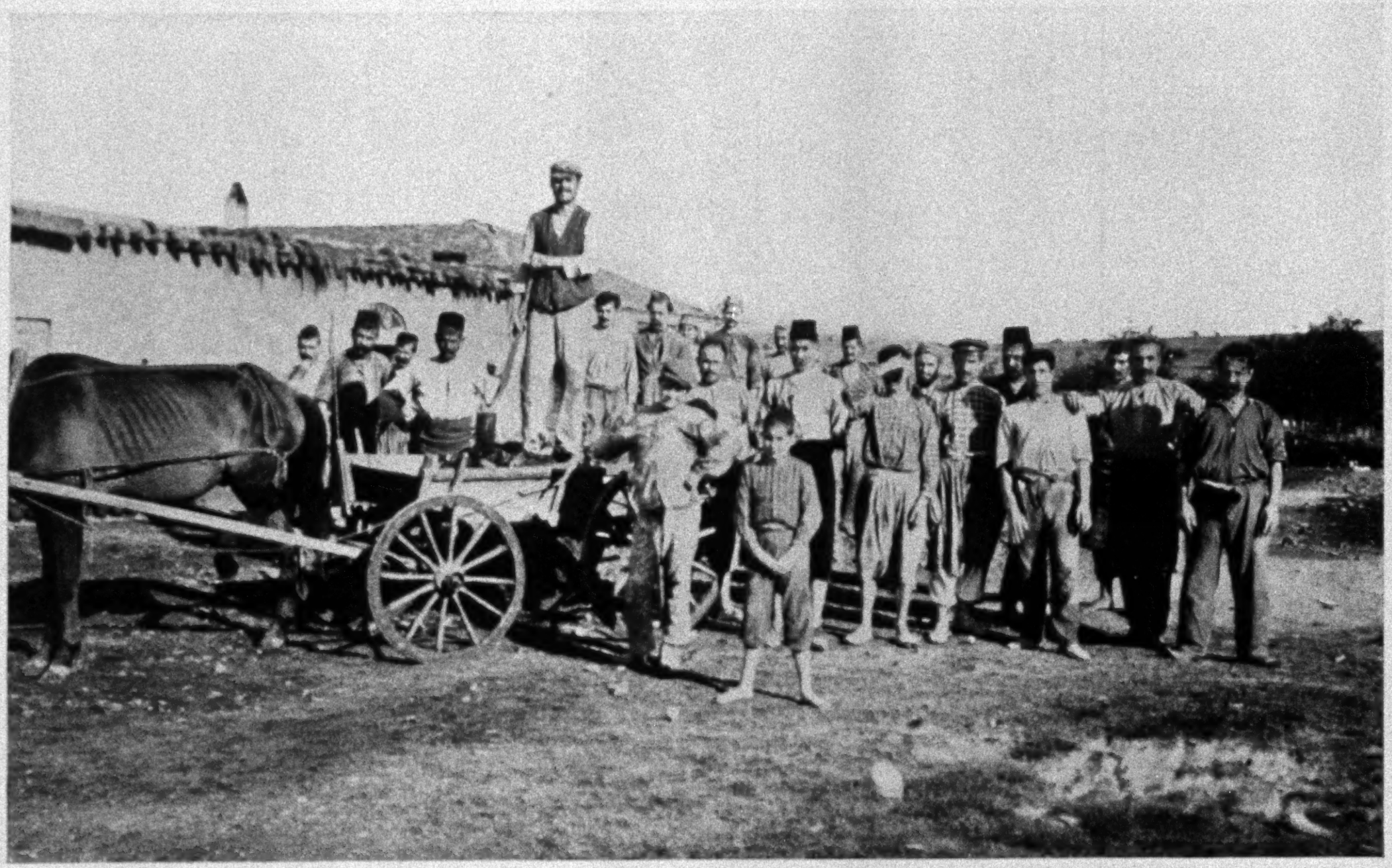
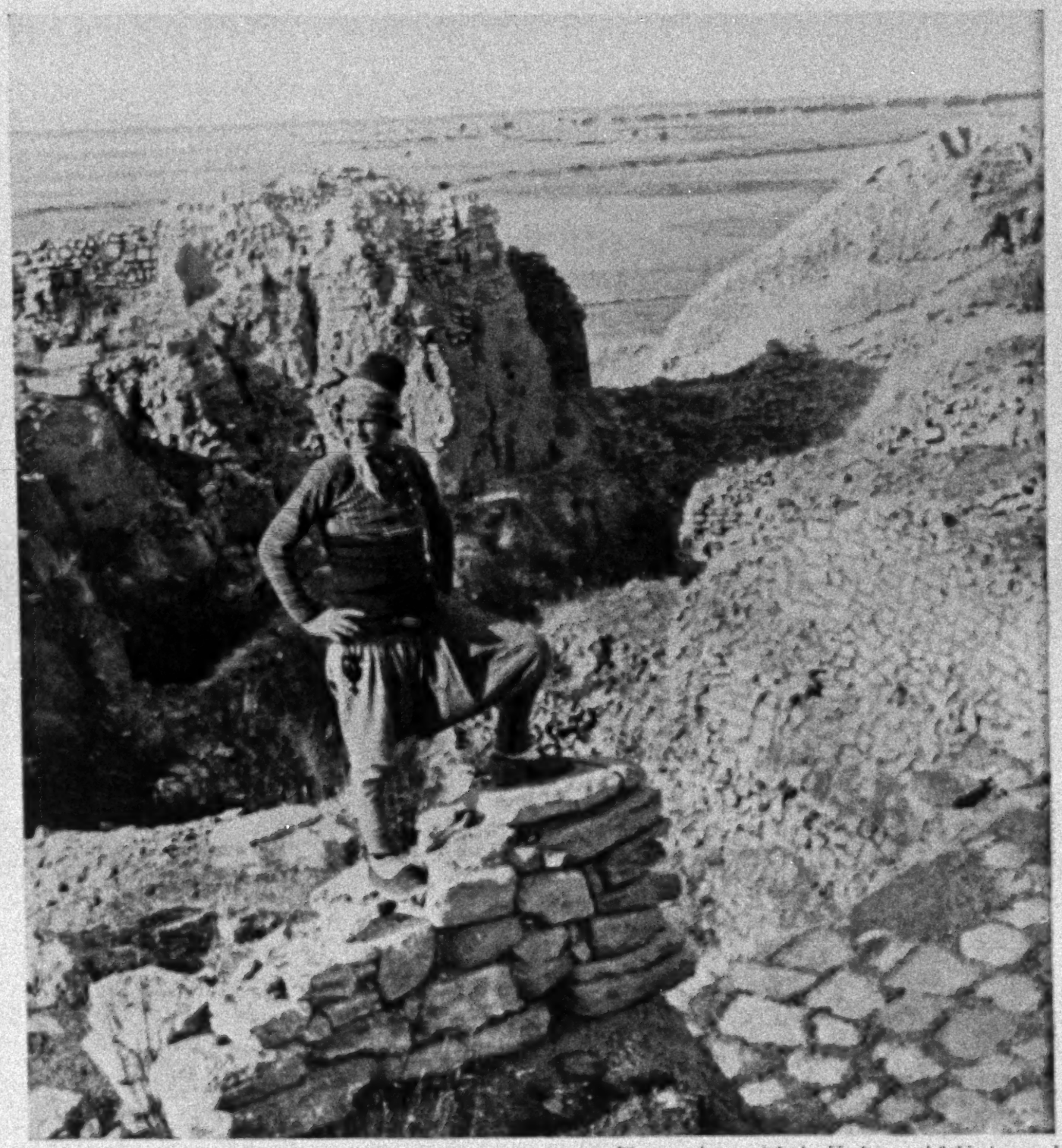


Photo by Ernest L. Harris

A GROUP OF VILLAGERS ON A HIGHWAY IN ASIA MINOR, NEAR TROY

The Turkish wagons are covered with black canvas and have little ornamented windows around the sides. There are also curtains which may be adjusted to keep out the rays of the sun or inclement weather (see page 450)



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THE TROJAN PLAIN OF HOMERIC STORY, LOOKING NORTHWEST FROM TROY TOWARD THE DARDANELLES

"Wall of Priam." It was meant to stand throughout the ages, whoever was its builder, and one ardently wishes to give the credit for its construction to those times. It is a noble wall, well pointed, well laid, well preserved, capable yet of withstanding such assaults as when

"Ajax strives some stone's vast weight to throw."

From its corner overlooking the plain of Simois an outside stairway descends toward the river, possibly a later feature. Could this have been the corner of the wall where stood the Scæan Gate; where the venerable Father Priam brought the beautiful Helen in order to show her the enemy, her own countrymen and kindred, on the plain below; where he pointed out the leaders, naming them individually?—"and there is Menelaus, thy former husband." It may well have been the same, and romance at least will have it so.

Photo by Ernest L. Harris

THE RUINS OF TROY

The excavations at Troy have revealed that no less than nine layers exist upon which, at various times during the past 5,000 years, human habitations have been built. The topmost layer are the remains of the Roman city of Ilium (see page 531). "Next beneath it lie two Hellenic villages which flourished between 1000 B. C. and the Christian era. The sixth city from the bottom is now widely accepted as Homer's Troy. It has a mighty circuit wall, with imposing towers, and is built of massive ashlar masonry. Its area is about two and a half times as great as that of the Second City and it flourished in the latter half of the second millennium B. C. Immediately below this stratum are the remains of three prehistoric settlements, with unimportant houses of stone and brick built on and with the ruins of the Second City and covering the period of *circa* 2000-1500 B. C.

"Archæologists were especially interested in the discovery of the Second or Burnt City, which antedates Homeric Troy by as many years as separated the latter from classical times. It was a small fortress, not more than one-third the size of the Acropolis at Athens, but well built with stout walls of stone surmounted by brick. At this level was unearthed an extraordinary mass of treasure, including silver jars, gold daggers, and diadems of pure gold, one of which was woven of more than 16,000 rings and leaves—a Crown jewel indeed. The Burnt City had a chequered career, for during an existence of about 500 years, 2500-2000 B. C., it was attacked and destroyed three times. Its predecessor was an unimportant primitive settlement, with walls of small quarry stones and clay, built upon the virgin rock." (From "Crete, Forerunner of Greece," by C. H. and H. Hawes.)

Scattered about are bits of sculptured marble, the remains perhaps of Roman or Alexandrine occupation. Off in the dreamy distance lies Tenedos—sinister Tenedos, not discernible except in the clearest weather—and by the shore near where the Dardanelles meets the sea, whence Thetis might at any moment arise, is a tumulus known as the Tomb of Achilles, and near by another, the Tomb of Patroclus.

The coast, perhaps five miles away, could scarcely have been so remote in ancient times. In other words, the Simois and Scamander have been behaving just like other rivers under the same circumstances—thrusting their silt and detritus into the sea, building up the adjacent shore, filling in their lower courses, and so becoming stagnant and marshy behind their work of repletion. In spite of their marshiness, however, the plains of Troy are beautiful, *decidedly* worth fighting for; and when one has seen the barren mountain-sides of Greece and the narrow, limited valleys that never could have nourished a large population in a generous fashion, it sets him thinking.

THE RUINS OF TROY

Some of the old Trojan towers are intensely interesting. The one situated at the north-eastern corner of the outer Mycenic wall is a gigantic pile having a thickness of no less than 60 feet. Even some of the prehistoric walls are from 30 to 40 feet in height at certain places, with a width of 12 feet.

Photos by Ernest L. Harris

THE RUINS OF THE ROMAN THEATER AT TROY

One of the Roman theaters is sufficiently preserved to give some idea of the use it was formerly put to. It was apparently similar in construction to like theaters, on a smaller scale, found at Priene and Miletus, and were perhaps used more as counsel chambers than as actual theaters. To the left is standing a Greek shepherd in his capote.

Photo by Ernest L. Harris

RUINS OF AN ANCIENT GRECO-ROMAN BRIDGE ACROSS THE EURYMEDON RIVER NEAR ASPENDOS, SOUTHEASTERN ASIA MINOR

This bridge is situated near the scene of one of the most sanguinary struggles in ancient history, namely, the double battle on the Eurymedon in 466 B. C., where the power of Persia was completely broken by the genius of the Athenian general, Kimon

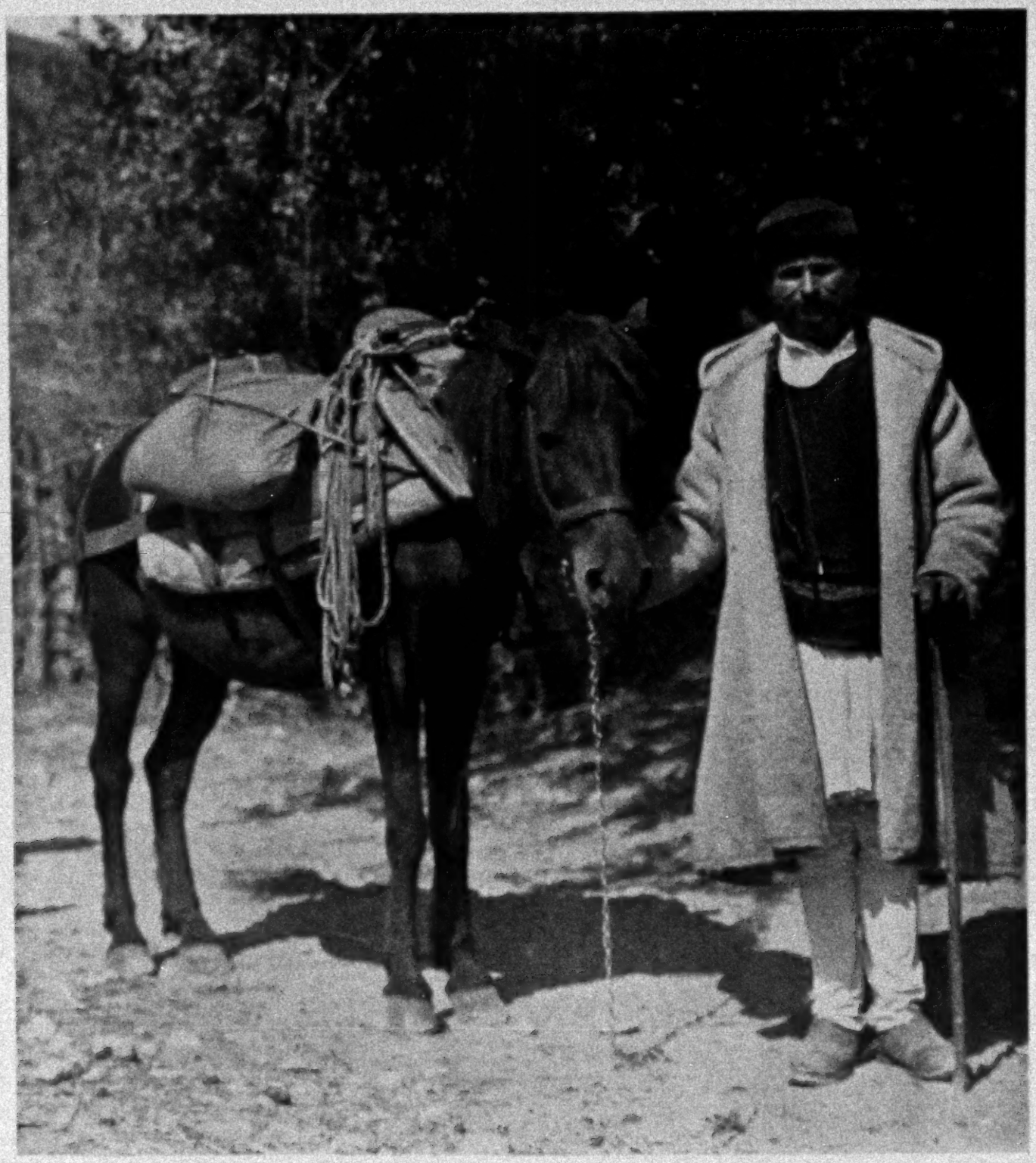

Photo by A. S. and D. W. Iddings. Copyright by Keystone View Co.

THE GREEK OF TODAY

Pardon the impious suggestion, ye who worship only at the shrine of the classics, but could it have been possible that Helen of Troy was only a myth? Or, to put it in another way, is it not possible, or even probable, that the beautiful Helen was only an impersonation, a figure of speech, for these beautiful plains which the Greeks coveted for their own sake? The valley of Argos, where ruled "Agamemnon, king of men," the greatest monarch of them all, could hardly have supported more than 10,000 farmers. Good, fertile valley soil, accessible to the sea, was certainly scarce in Greece and very desirable to men like the sons of Atreus.

Their stronghold, Mycenæ, at the head of the valley of Argos, where the famous "Lion Gate of Mycenæ" still guards the ancient threshold of Agamemnon and Clytemnestra, was apparently the stronghold of a piratical race, whose vessels roamed the seas. A people that could send out expeditions after somebody's

GREEK SHEPHERDS OF ASIA MINOR CLAD IN THEIR SHEEPSKIN CAPES

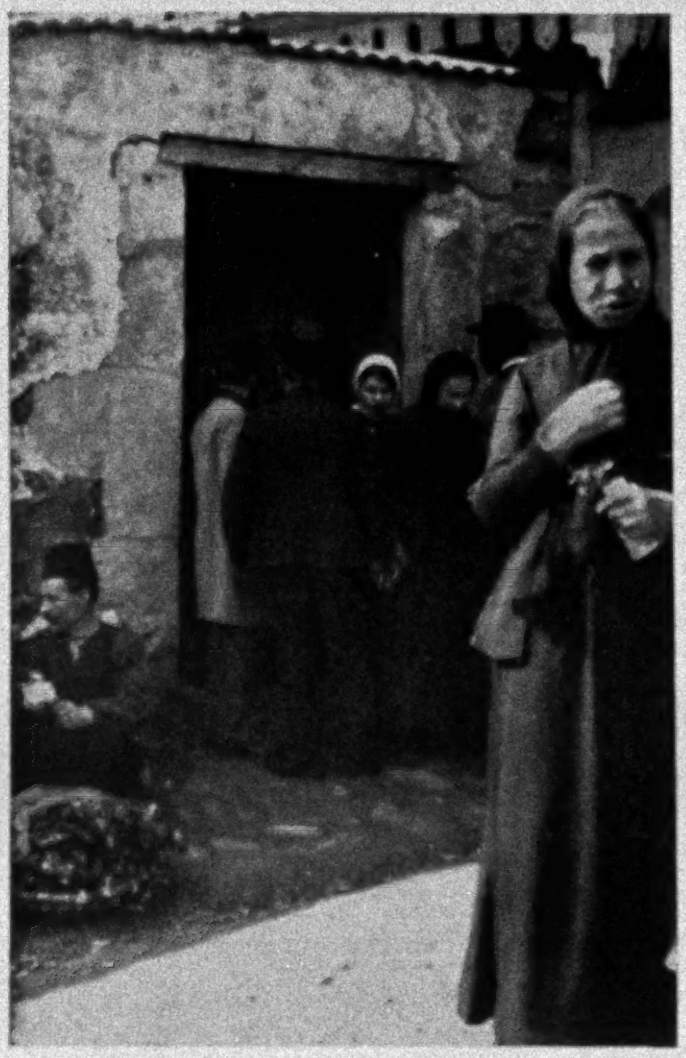

Photo by H. G. Dwight

GREEK TYPES AT A CHURCH FESTIVAL IN THE MARMORA

The islands and villages of the Marmora are today as they always have been—more Greek than anything else.

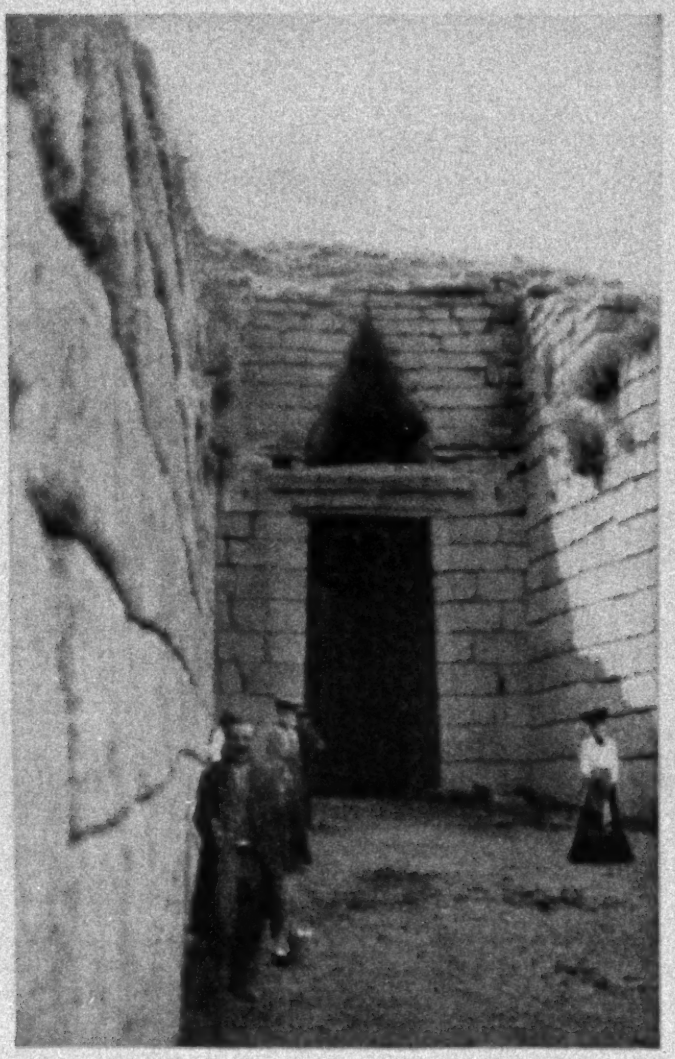

Photo by A. C. Barler

THE TOMB OF AGAMEMNON AT MYCENÆ, GREECE

else golden fleece and then write undying accounts of their heroic buccaneering would not halt long for a pretext to attack, nor scruple to gild their cupidity by means of a poetic story.

Oh, well, we have the story, which is its own excuse for being; so never mind about the history or its rationale. We prefer to believe in Helen as beauty personified rather than as greed personified, regardless of the evidence. Hence her future is secure as long as men are what they are, and hence also the eternal charm and freshness of the story. The assured immortality of the Iliad lies in this: That two nations engaged in a heroic struggle with each other, not for gain, not to reassert the rights of Menelaus, but for that which all men agreed was the most beautiful object in the world—in a word, for the principle of beauty itself.

NOTES ON TROY

It was under Roman rule that Ilium, the ninth city built on the site of Troy, reached the height of its splendor and importance. It is evident that the Romans thoroughly believed the legend that the fleeing Æneas, after many wanderings, finally landed in Latium and became the lineal ancestor of the kings and founders of Rome.

What Jerusalem and Mecca are today to those of the Christian and Mohammedan faiths, so once was Ilium to the inhabitants of Rome. In other words, Troy was the mother of Rome, in their belief, and the classic citadel of Homeric fame became an object of veneration to every true Roman and something to which to make a pilgrimage before he died. This belief is abundantly supported by the fact that Ilium in turn was visited by Sulla, Cæsar, Hadrian, Cara-

MAP OF THE GATES TO THE BLACK SEA

calla, Marcus Aurelius, and Constantine the Great.

It was Sulla who began to adorn Troy with beautiful temples, as conceived by Alexander and partly executed by Lysimachus, and to see in Ilium the cradle of the Roman race. Cæsar also offered up sacrifices to the gods at Ilium and, what may not be generally known, he conceived the idea of making Troy the residential city and center of the Roman Empire. Even Constantine thought of erecting his capital at Ilium before he finally selected Byzantium, in 330 A. D., and he gave it the name of Constantinople.

During the reigns of the Byzantine emperors the town and citadel of Troy fell into decay and was completely neglected. The stones and marbles were carried away and used as building material. The Turks never attempted to build a town at or near Troy. The soil and debris of a thousand years finally settled down upon the classic mound, completely veiling it from the outside world until it was uncovered by Schliemann, 40 years ago.—Ernest L. Harris.

"Goodness! look—
What's on my hook!
Such luck to come
to me!
A finer dish
Than any fish
That ever swam
the sea!"

Have you "caught on" too?

Have you caught on *good?* Do you and your family get the full benefit and enjoyment of

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Do you know how rich and delicious it is when prepared as a cream of tomato; and how easy it is to prepare it in that way? Do you know how snappy and appetizing it is when served as a plain tomato bouillon? Have you ever tried it with boiled rice or noodles in it?

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LOOK FOR THE RED-AND-WHITE LABEL

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Ripolin Enamel Paint was applied to the interior of my home fourteen years ago and is in just as perfect condition now as the day it was first put on.

"In my living rooms I have the pure white Eggshell finish—soft and beautiful. In my kitchen and pantries, the high Gloss Finish—buff color. If people could only see Ripolin in actual service and know it as I know it, they would never accept anything in its place." Then he mentioned the satisfaction of escaping once for all the need of repainting. "We simply use a damp cloth," he said, "and Ripolin freshens up like new—never discolors, cracks, chips, or peels."

This man's evidence is typical of others who use Ripolin, because it insures you against the trouble and cost of repainting—simple cleaning is all it needs—and remember that Ripolin can't be harmed by any amount of rubbing and scrubbing.

Made by the old Dutch hand process, a gallon will cover from 500 to 700 square feet, depending upon the surface. Your painter or decorator will tell you the quantity needed.

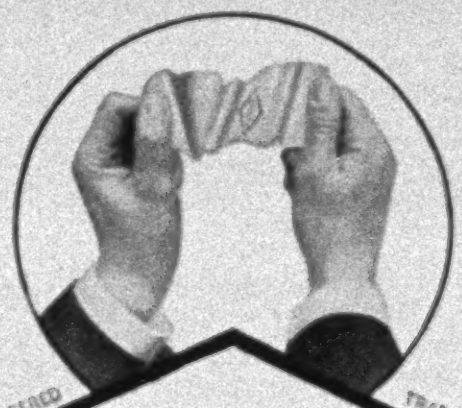
That brilliant, high gloss finish is unexcelled for the kitchen, pantry, or wherever a glasslike surface is desired. Then again for halls, reception rooms, libraries—wherever the softer effects are preferred—Ripolin is obtainable in a beautiful eggshell finish, or even an absolutely flat finish. Any desired tint can be obtained by mixing pure color ground in Japan with white Ripolin—a buff or light green shade is excellent for kitchen walls.

Unsurpassed for automobiles—choice of 12 beautiful colors; also yachts and motor-boats, because it is the only enamel that will stand the test of salt water and sea air.

Send 50 cents today for large trial can, with brush—enough to give a thorough test—try it out in your own home—then you be the judge. With it we will send the coated strip of tin and the book showing residences, exclusive clubs, and palatial hotels finished with Ripolin; also name of the Ripolin dealer in your territory.

Make Your Own Test

Bend this strip—prove to yourself that Ripolin is so elastic and tenacious that it cannot peel, flake, or blister. This coated strip will show you why Ripolin retains its freshness year after year without repainting but merely cleaning.



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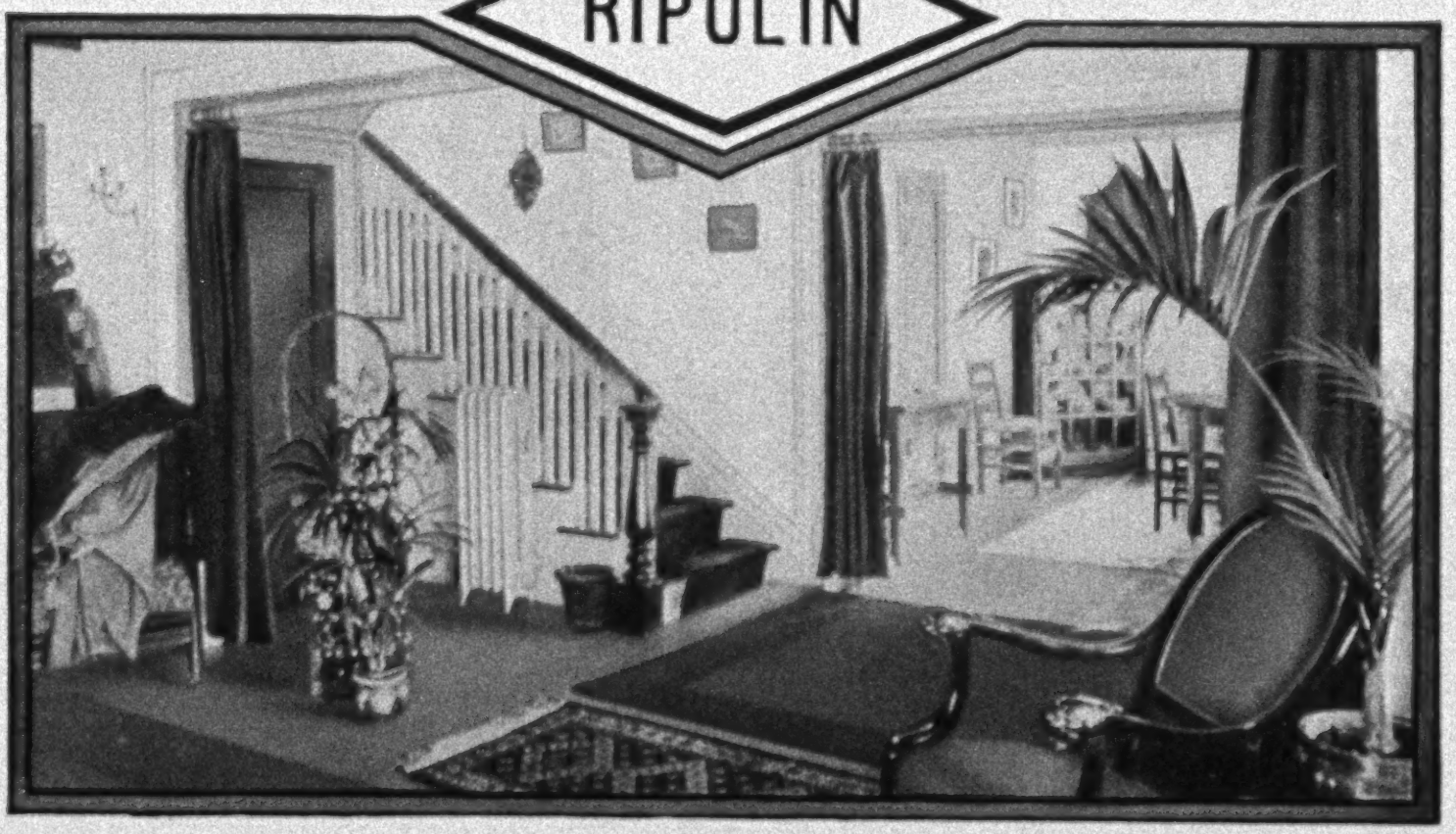

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Neighborizing the Farmer

One of the most significant facts of our telephone progress is that one-fourth of the 9,000,000 telephones in the Bell System are rural.

In the days when the telephone was merely a "city convenience," the farms of the country were so many separated units, far removed from the centers of population, and isolated by distance and lack of facilities for communication.

But, as the telephone reached out beyond cities and towns, it completely transformed farm life. It created new rural neighborhoods here, there and everywhere.

Stretching to the farthest corners of the states, it brought the remotest villages and isolated places into direct contact with the larger communities.

Today, the American farmer enjoys the same facilities for instant, direct communication as the city dweller. Though distances between farms are reckoned in miles as the crow flies, the telephone brings every one as close as next door. Though it be half a day's journey to the village, the farmer is but a telephone call away.

Aside from its neighborhood value, the telephone keeps the farmer in touch with the city and abreast of the times.

The Bell System has always recognized rural telephone development as an essential factor of Universal Service. It has co-operated with the farmer to achieve this aim.

The result is that the Bell System reaches more places than there are post offices and includes as many rural telephones as there are telephones of all kinds in Great Britain, France and Germany combined.

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One Policy *One System* *Universal Service*

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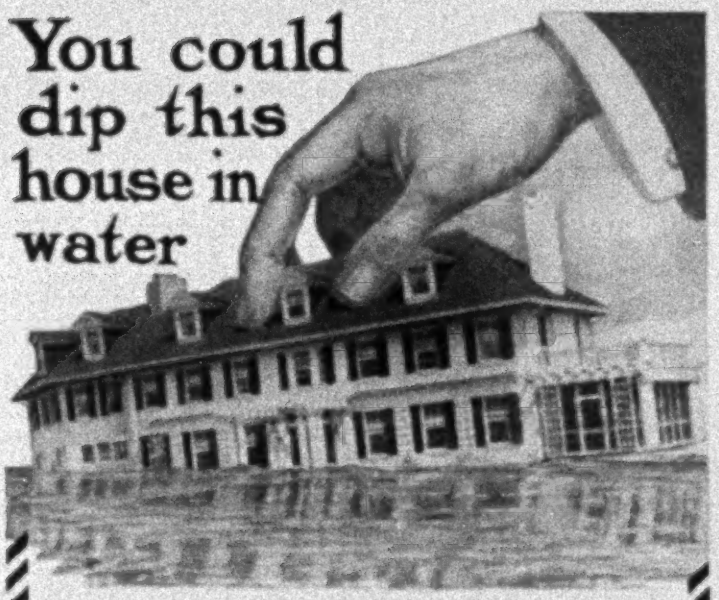

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A liquid cement coating which becomes an inseparable part of the wall, sealing all pores and filling hair-cracks. Hard as flint. Dampproof, weather-resisting. Gives uniform, artistic color. Applied to new or old walls. Furnished in a variety of pleasing tones.

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Cheaper, cleaner, and more efficient than the horse-drawn contrivance. Direct drive—chainless, with no consequent loss of power.

The only low-priced power-driven mower with driving roller behind the cut. Roller divided into three parts, making the action in turning mower same as differential in an automobile—machine actually rolls and does not drag.

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The Perfection Riding Mower is the finest machine of this type. Price, $600. Bosch Magneto, $35 extra.

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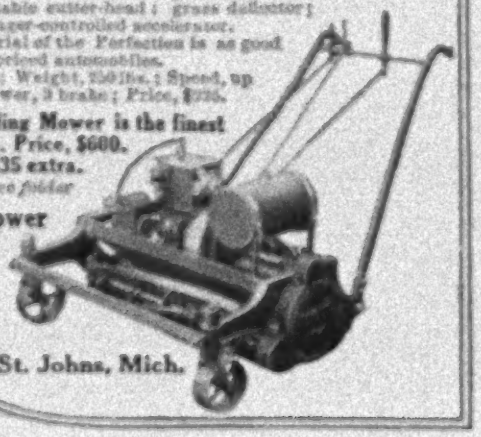

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32x3½	13.75	15.40	2.70	3.05
34x4	19.90	22.30	3.90	4.40
34x4½	27.30	30.55	4.80	5.40
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Firestone
NON-SKID TIRES

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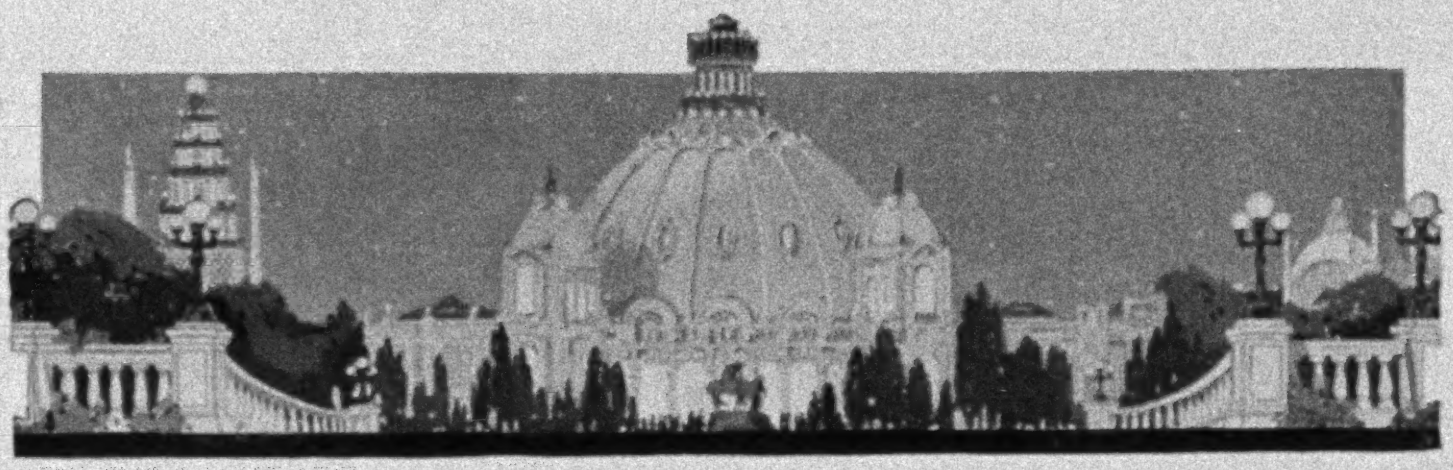

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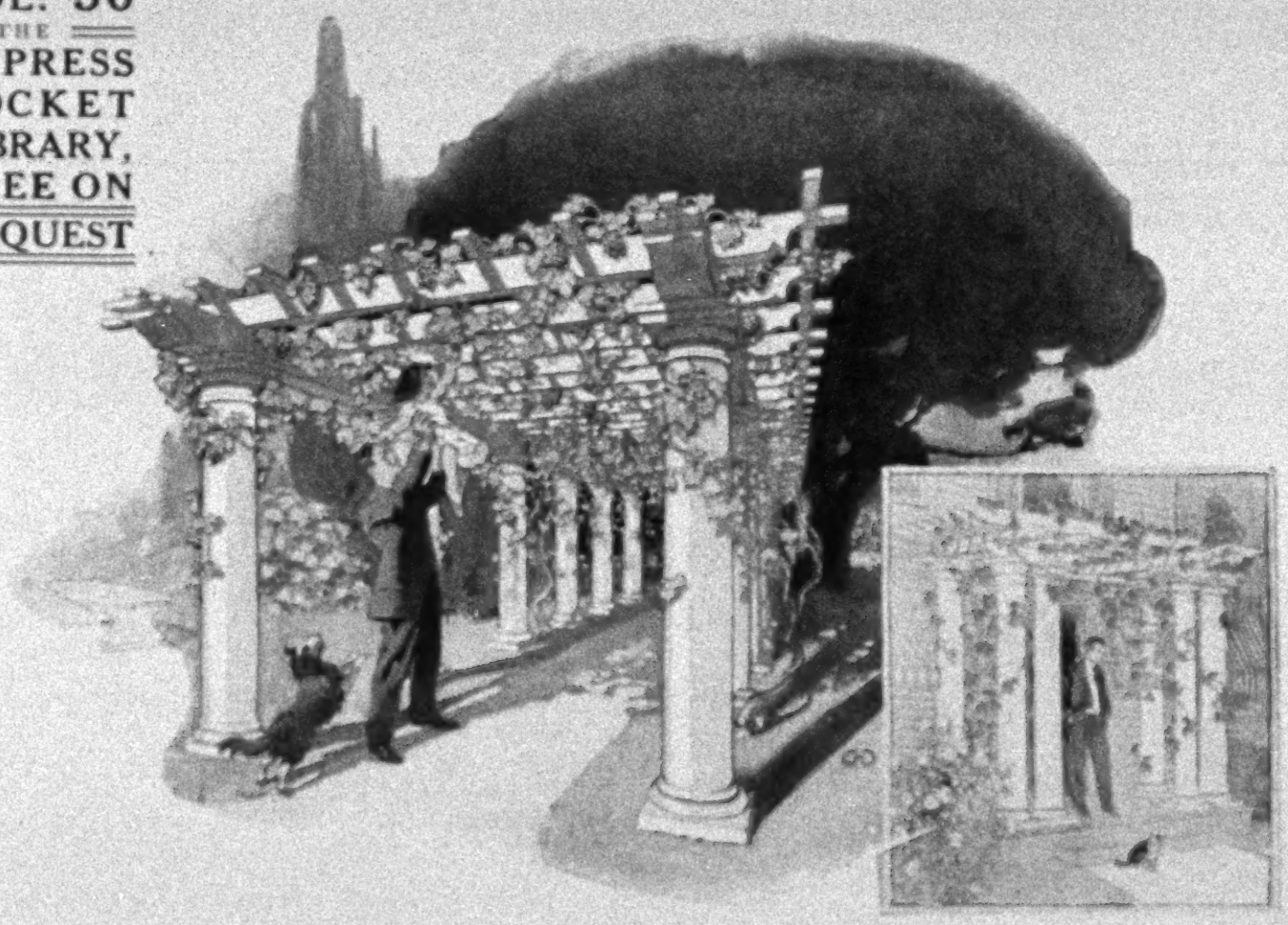

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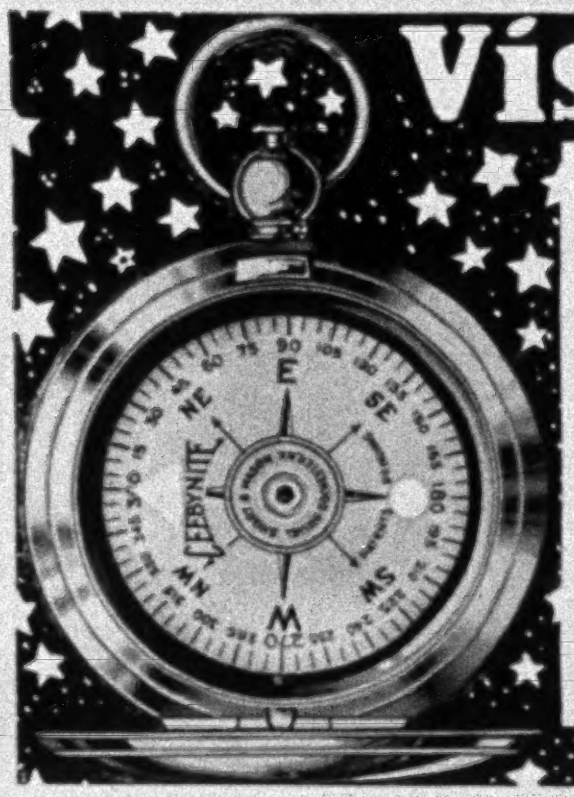

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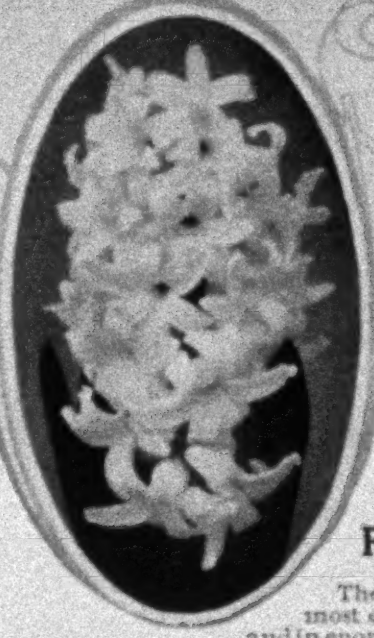

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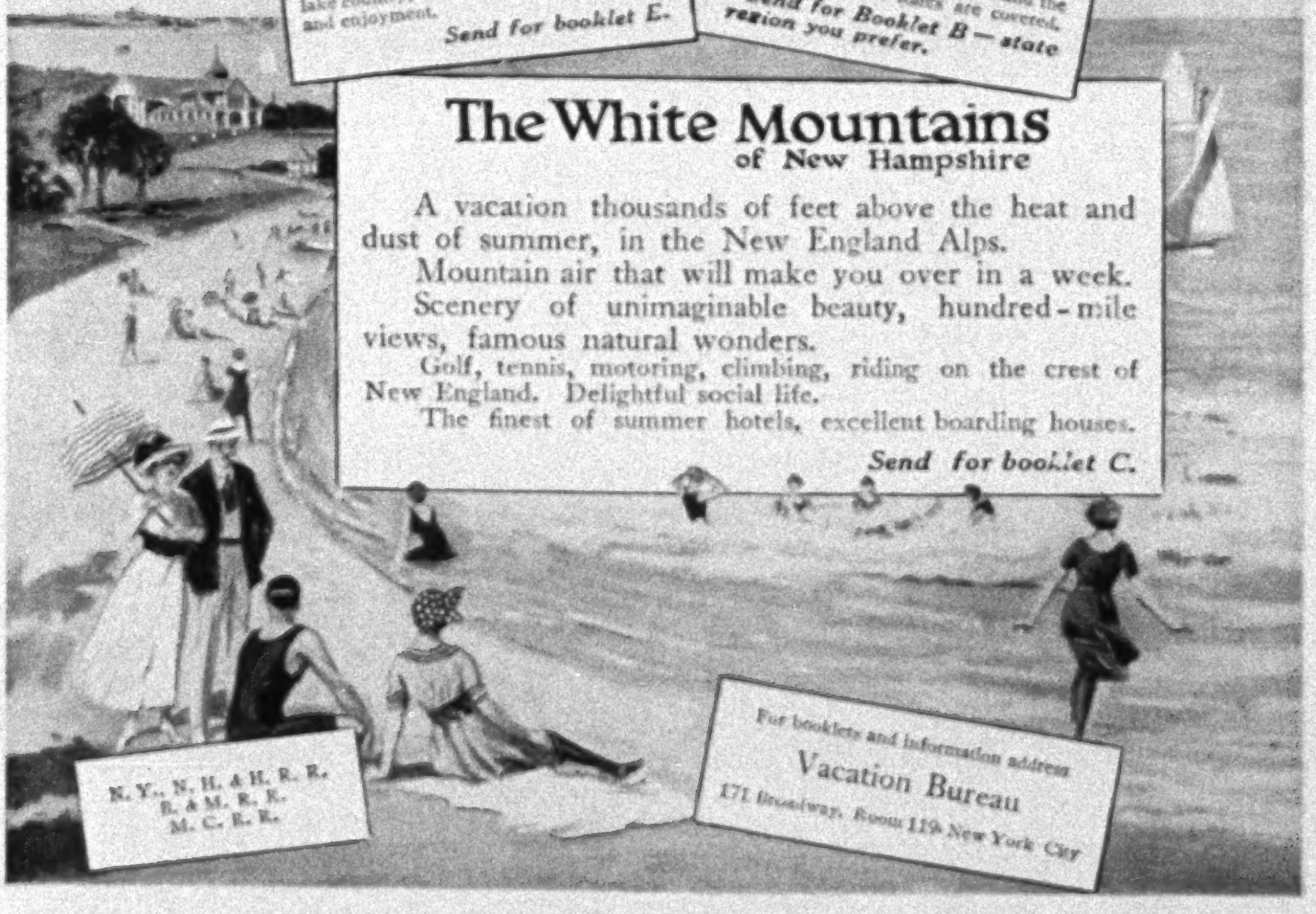

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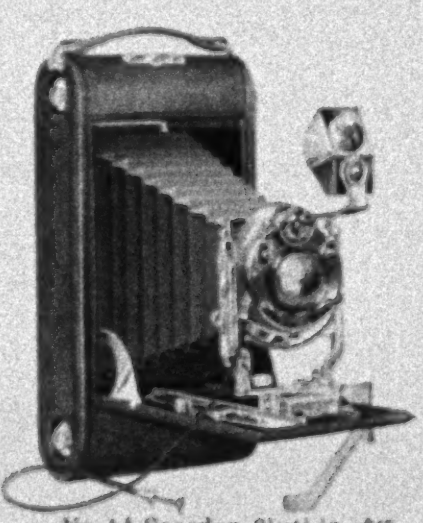

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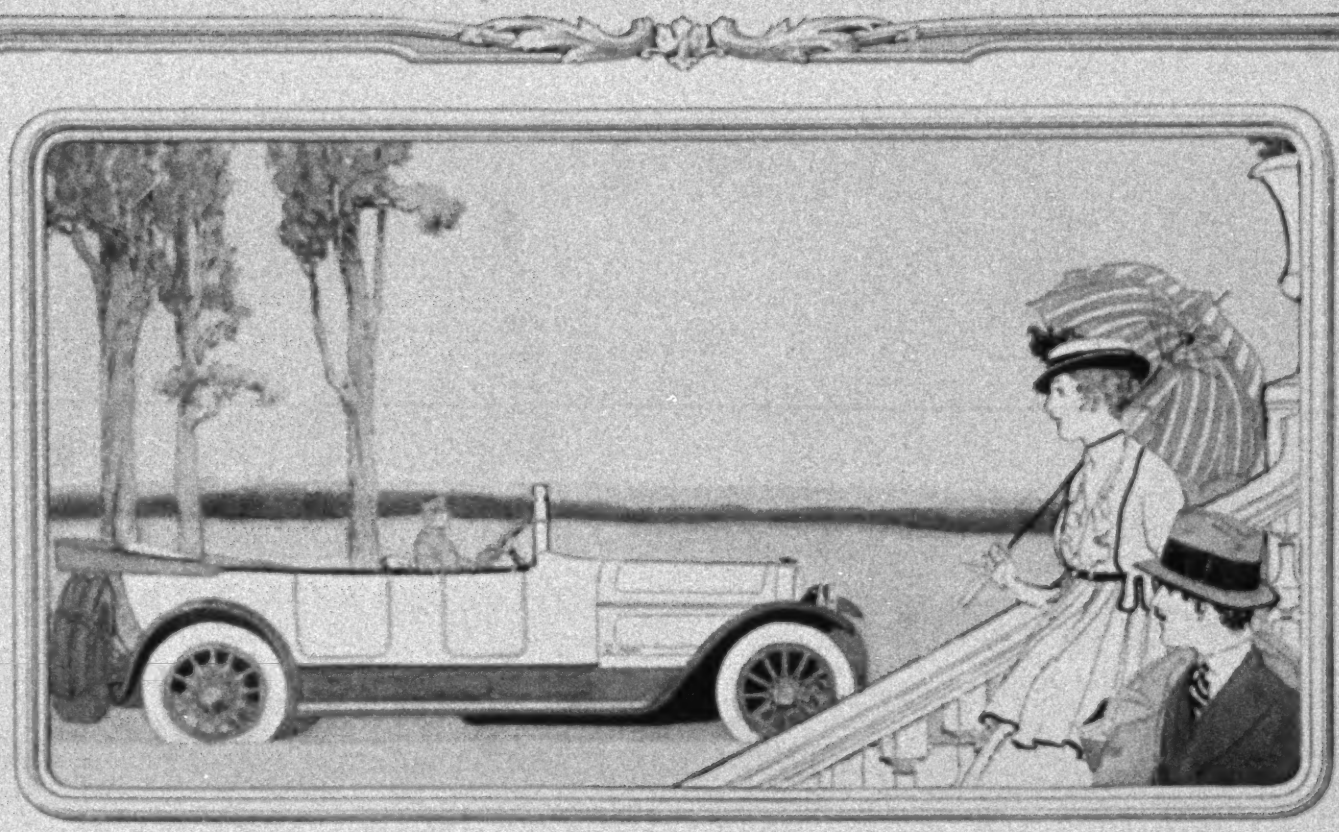

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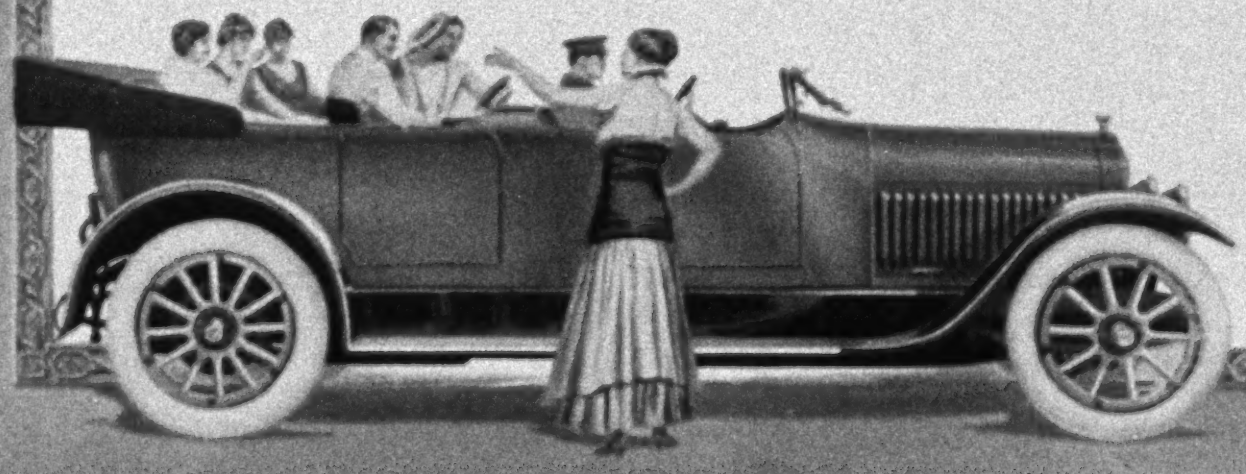

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